

THE IMPACT OF TWO WARS  
UPON TRENDS IN KANSAS AGRICULTURE

by

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## INTRODUCTION

### Purpose

Powerful and far-reaching forces generated by wars upset the economic balance of a country, and these maladjustments increase with the extent and violence of the conflicts. Agriculture, one of the most basic of the productive industries, is among the first to be diverted from its normal course by the stimulus of wartime demand for its products. Because of the magnitude of the problem, any attempt to analyze the economic consequences of war must be localized and restricted to certain cycles of economic activity and periods of time. The purpose of this study is to show the impact of the two wars upon price, production, income, and other related trends in Kansas agriculture; and by means of the similarities and differences between the two war periods to anticipate some of the postwar conditions of World War II.

During the period of rising prices that accompanied past wars, farmers occupied a relatively favorable position compared to other producers because costs of farm production tended to climb more slowly than did the prices received for farm products. This meant a wider margin of profit for the farmer with an increased net income and greater purchasing power for the farm population. The desirability of farming as a business enterprise was enhanced and farmers responded to demands for

greater production by expanding farm operations.

But the peak of war induced prosperity was soon reached, and on the downgrade farm prices outstripped all other prices in the rapidity with which they dropped, the depths to which they fell, and the slowness of their recovery. Costs of production did not keep pace with falling prices. All too quickly a point was reached where farmers found it cost nearly as much to raise a bushel of grain as the sum that could be obtained from its sale. Those farmers who had expanded their operations on borrowed funds suffered acute financial distress. Mortgages were foreclosed. Standards of living were reduced. Discontent and often suffering were spread throughout the ranks of the farm population. This became the familiar story of the effect upon agricultural welfare in the United States of changing price relationships brought by World War I and its predecessors. The question to be considered, herein, is how closely was this wartime pattern of economic change repeated during World War II, and now that the war is over will the postwar period bring the same economic repercussions in agriculture that followed World War I.

#### Scope

What happened to certain general phases of the State's agriculture during World War I and its immediate aftermath were reviewed as a background for the examination of the more

recent wartime status of farm enterprises. Included in the scope of the study are price and production of selected commodities, farm income, and some cost trends for the state as a whole during the two wars; and specific examples of the effects of the recent war on individual farms as shown by several Farm Management Association account records kept during the years 1935-1944.

The war period of World War I was considered as including the years 1914 through 1921; while 1939 was used as the beginning year for World War II. Economic changes of the first war were compared with a 1910-1914 base year period and those of World War II with a 1935-1939 base. By the use of two prewar base periods, the immediate distortions wrought by war on price, production, and income trends were more readily discernible.

#### Limitations

Two important limitations to this study were: (1) the subject was too broad and complex for adequate treatment, and (2) data for the World War I period were incomplete and might not be exactly comparable with that of World War II.

Economic, political, and social changes growing out of World War I experiences during the period between the two wars had an effect upon price, production, and other trends during World War II. It was impossible in this study to do much to evaluate these happenings in relation to the changes taking place during the second World War.

The role of the weather, perhaps the most dominant of all factors affecting agricultural production, defies measurement. Yet in any attempt to find parallels between the two war periods, it should be recognized there were differences due entirely to favorable and unfavorable precipitation.

Much has been written and much statistical data published concerning the fate of the American farmer during World War I, but little has been done to apply these findings to states or other local areas. A large part of the early data available for the United States has never been allocated to the states. Figures on farmers' cash income from marketings, to some extent a barometer of agricultural prosperity, have not been presented for Kansas for the years before 1924. This necessitated certain assumptions concerning the income of the World War I period based on data only partially complete.

#### Methods of Procedure

The underlying method followed in the development of this study was analogy since the nature of the subject matter seemed well fitted to this type of treatment. In the application of this method, it was necessary to use statistical analysis and to rely heavily upon index numbers. Many of the trends of the two war periods were presented graphically. Since index numbers measure change only in relative terms and for the aggregate of Kansas agriculture, it seemed desirable to employ yet another

method whereby emphasis might be shifted to actual conditions. This touch of realism was supplied by case studies of seven individual farms which furnished first hand information on farm operations throughout the prewar and most of the war period of World War II.

Published series of index numbers for Kansas agriculture were limited to the following three groups of indexes originating in the Bureau of Agricultural Economics of the United States Department of Agriculture: A price series on the 1910-1914 base for six groups of commodities--all commodities, meat animals, dairy products, poultry and eggs, grain, and a miscellaneous category; the index numbers of farm real estate values on a 1912-1914 base; and an index series of the estimated amount of farm mortgage debt on a 1935-1939 base. Since it appeared desirable, the base period for each war was the five prewar years, and the price indexes for livestock and livestock products and real estate values when used for the World War II period had to be shifted to a 1935-1939 base; while the indexes of farm mortgage debt had to be placed on the 1910-1914 base to be shown for the World War I period.

All other indexes for prices and all indexes for production, cash income, volume of marketings, and wages were calculated or constructed especially for this study and have not been presented elsewhere. To make these index numbers, data, especially for the World War I period had to be pieced together from many widely scattered sources. Cash income figures for World War I had to be

estimated to some extent by the method described in detail in the appendix of this study. While following the statistical method used by the Bureau of Agricultural Economics, the composite indexes of feed-grain prices for Kansas were constructed to include grain sorghums for which no price series prior to 1924 has been published. Fortunately, these prices for 1910-1921 were on file in the office of H. L. Collins, State Statistician, and were obtained from this source. All the research facilities including filed material and other data belonging to the Department of Agricultural Economics and the Extension Service, Kansas State College were accessible for this study. More than 150 annual account records of the Farm Management Associations were summarized to obtain the data for the case studies of individual farms.

## REVIEW OF LITERATURE

### Comparison of the Two Prewar Periods

A history of agricultural conditions preceding the world wars would trace little if any similarity between the two periods. According to Edwards (1) there was a relatively prosperous period for agriculture in the United States from 1900 to 1914. Commodity prices and land values were rising slowly. Although minor business recessions had occurred in the intervening years, the last major depression was in the 1890's nearly 20 years before 1914. Preceding the outbreak of World War II was the severe depression of the 1930's.

The chief problem confronting the farmer in 1914 was how to increase production while in 1939 farm surpluses troubled statesmen as well as farmers. Government programs to keep down the acreage of wheat and other staple crops and to control the production of hogs and other livestock and livestock products had been in effect since 1933. When the United States entered the war in 1917, grain and other food stocks were dangerously low. This is in sharp contrast with the food situation at the entry of the United States in World War II. Then, the stocks of grain in storage were large enough to keep grain prices from rising as rapidly as might be expected immediately after a declaration of war.

An important shift in the position occupied by the United

States in international finance had occurred between the two wars. This change is summarized by Jesness (6) in the following statements:

In 1914 this country was a debtor nation as a result of the loans and capital investments made here by other countries. The large purchases made by European nations during the war offset the amounts we owed abroad and the credits they arranged for purchases in the United States changed our status to that of a creditor nation.

Since the shift from debtor to creditor status was not reflected in the foreign trade policy of the United States, it tended to depress the nation's export trade, thus contributing to the problem of surplus commodities.

#### Technological and Other Developments In Agriculture Between the Wars

Great changes both technological and otherwise occurred in Kansas agriculture between the two wars. Writing of such changes in the United States which are no less true for Kansas since 1914, Peterson (7) has made the following statements:

Motor vehicles have revolutionized agriculture during the last generation; production, by tractors; marketing, by motor trucks; and farm life by automobiles. Before 1914 there were few automobiles and very few motor trucks on farms. The use of tractors was in its infancy. Electricity on a farm was a novelty, and there were no combines, and other farm machines have been redesigned to fit the needs of family-sized farms....

Agriculture has been truly dynamic in the last 25 years--more so than ever before. Progress has not been limited to machines; marked changes have also taken place in plants, in ways of processing and using farm products and in land use.

The shortage of farm labor during World War I gave impetus

to the use of tractors and other farm machinery in Kansas. Machine power rapidly replaced horsepower and manpower. In the years following the first World War, all but a few farming sections of eastern Kansas became almost completely mechanized. This shift from horse to machine power caused changes in the pattern of production since land once devoted to the growing of feed for work animals could be used for the production of crops for other purposes, particularly for the maintenance of increased numbers of meat animals. There is no estimate of the acreage of cropland released as the shift came gradually over a period of time, but the total must have been considerable.

Now crops as well as new varieties of old crops had entered the production picture in Kansas by the time of World War II. Hybrid corn, Pawnee and Ternmarq wheat, drought resistant sorghums, and Balbo rye are but a few of the new varieties that have been the plant breeders contribution toward removing some of the risk and adding to the profit of the agricultural industry. The soybean, a crop completely unknown in Kansas until some years after World War I and still of minor importance in the early 1930's, made phenomenal gains throughout the state under the stimulus of World War II.

#### Government Regulations Affecting Agriculture During World War I

Government regulation and control over prices and production while not unknown during the period of World War I assumed a

larger role in World War II. It would be difficult to evaluate the effect of the part played by the government in economic stabilization during World War II, but it must be recognized as a factor which has brought about differences between economic conditions of the two war periods.

Prior to the passage of the Food Production Act in 1917, whatever government action had been taken to encourage agricultural production had been carried out by the United States Department of Agriculture. The Smith-Lever Act of 1914 had greatly expanded the extension work of the department so that it was only logical that when the Food Production Act became a law it should be administered by the Department of Agriculture. State Councils of Defense which had been created in most states by the action of the respective state legislatures worked in close cooperation with the Department of Agriculture. Many local problems pertaining to increased food production were handled by the state organizations. But the chief function of the State Councils was the carrying out of plans originating in the Department of Agriculture.

The following suggestion of the work of the Kansas State Council of Defense in World War I was taken from a report by Jardine (5) describing the councils action following the emergency caused by the huge wheat abandonment in Kansas in the spring of 1917:

The State Council of Defense recognized at once that the first job before Kansas farmers was getting the maximum amount of the abandoned wheat land into spring crops. With a larger acreage than ever to be planted, good seed

and labor were scarce. To meet the situation a preliminary survey was made of the state's agricultural resources and information obtained on the amount of idle land in the state; the best crops to plant; the labor situation, including man, horse, and machine power; the available seed supply; the counties lacking seed and the amount, etc.....

Food control in World War I was centered in the hands of the War Food Administration. This special agency created by the Food Control Act of August, 1917, was not within the Department of Agriculture, but it was designed to cooperate with the department. Briefly, the field of the Department of Agriculture was to stimulate food production while the main problem of the Food Administration was distribution and conservation in the consumption of food. The Food Administration determined policies and State Food Administrations worked with county organization and local Councils of Defense to carry out the plans determined by the federal agency. All price control measures employed during World War I either were originated by the Food Administration or were authorized by the Food Control Act of 1917. Of particular interest to Kansas farmers was the provision of the food act establishing a minimum price for wheat. Averages of Kansas farm prices for May, 1917, of wheat reached the all time high of \$2.66 per bushel. The price guarantees to wheat growers set up by the Food Control Act have been summarized by Peterson (7) as follows:

The food act of August, 1917, provided a minimum price of \$2 a bushel for the next year's crop which would begin moving to market about June 1918, the purpose being to encourage fall and spring plantings of wheat by offering a price guarantee. On September 2, 1918, the President extended the guaranteed wheat price (\$2.20 by that time) to the 1919 crops.....

No attempt was made to control meat in the manner applied to wheat but an effort was made by the Food Administration to maintain a minimum price for hogs. This method has been described by Peterson (7) as follows:

Government purchases of hog products for the Army and Navy, the Allies and the relief agencies were directed toward the announced purpose of keeping prices of hogs, in Chicago, from falling below \$15.50 a hundred. In an effort to increase hog production in 1918, The Food Administration set out to try to stabilize prices at an equivalent of 100 pounds of hogs for 13 bushels of corn. To carry out its price policy for hogs, the Government not only made purchases, but controlled receipts at primary markets through a system of embargoes and car allotments, licenses to dealers and packers, and to some extent, regulation of the profits of packers....The Food Administration found it difficult to maintain hog prices equivalent to 13 bushels of corn at Chicago. It therefore lowered the ratio from 13 to 11, but basing it on average prices for corn at local farmers' markets rather than on Chicago prices. Indignant farmers charged the United States and British Food Administrations with lack of good faith.

The price guarantees for wheat and hogs were the only specific price control measure applied at the farm level, but price and production controls and priority system in other industries undoubtedly operated indirectly to affect the agricultural industry during World War I. None of these government regulations were allowed to extend much beyond the Armistice of November 1918. The wheat crop of 1919 was the last crop to be marketed under the price guarantee plan of the first World War. Compared to the economic controls of World War II those of World War I had a short life and were lacking in complexity.

## Government Regulations Affecting Agriculture During World War II

The government price and production control program affecting agriculture during World War II was varied and complex as well as dynamic in that frequent changes to fit new conditions and unforeseen contingencies have been made. A complete summary of this program and the agencies who administered it would be beyond the scope of the present study. Clark's (2) apt description given below is indicative of the problem of such a summarization:

A detailed account of wartime controls would be a very lively moving picture, and the only way to put it on paper would be in the form of a looseleaf encyclopedia, constantly revised.

The wartime agricultural price and production program had a threefold purpose: First, to lead out the necessary production of basic crops plus a sizeable list of war-needed commodities; second, to protect the interests of farmers by assuring a fair price for the products of their labor and capital; and third, to hold down the cost of living and at the same time to provide an adequate and balanced diet for consumers. In accomplishing this purpose considerable dependence was placed upon price supports and price ceilings.

Commodities under price supports have been considered in three groups. Wheat, corn, cotton, tobacco, rice, and peanuts have been classed as "basic" commodities. The "proclamation" commodities have been eggs, hogs, chickens, turkeys, butter,

cheese, dry skim milk, evaporated milk, specified varieties of dry peas and dry edible beans, peanuts for oil, soybeans for oil, flaxseed for oil, American-Egyptian cotton, and potatoes. The "miscellaneous" classification has included barley, grain sorghums, sweet potatoes, and some truck and orchard crops.

Both price supports and price ceilings for farm products have been related to the parity concept. Employed previously in a series of agricultural acts beginning in 1933 aimed to raise farm prices, parity price had been defined by the Agricultural Adjustment Act of 1933 as "that price for the commodity which will give to the commodity a purchasing power with respect to articles that farmers buy equivalent to the purchasing power of such commodity in the base period." Purchasing power referred to the ratio that the prices received for farm products had to the prices paid for articles which farmers bought. The base period most commonly used has been from August 1909 to July 1914. Parity was redefined as follows in 1938 by Congress in the Agricultural Adjustment Act of that year:

Parity, as applied to income, shall be that per capita net income of individuals on farms from farming operations that bears to the per capita net income of individuals not on farms the same relation as prevailed during the period from August 1909 to July 1914.

By making the definition apply to net income some costs of farm operation became a part of the parity ratio thus making it more favorable to the farm population.

The basic crops harvested after 1941 were supported at not less than 85 and later at 90 percent of parity with the exception

of cotton which had a slightly higher guarantee and feed grains for which the maximum was 85 percent of parity. By Congressional action these supports are to be maintained for two calendar years after the year in which the war is officially declared to be at an end and provided funds for carrying out the program are made available. The other commodities were supported at 90 percent of parity or more as there was no limit for war-needed commodities if a higher price was deemed necessary to encourage production. The same postwar price guarantees apply to "proclamation" and "miscellaneous" commodities as were extended to the "basic" commodities.

During World War II the price guarantees were carried out by various methods. Direct purchases by the government for the armed forces and lend-lease were important factors while the war was in progress. Loans at parity ratios were made by the government to the growers of "basic" and some of the other crops. The commodities stored on the farm or in public elevators stand as security for the loans. If the price rose above parity, the farmer could sell the crop and pay off the loan. When the price remained at the parity level and the farmer did not redeem the loan, the government took title to the stored commodity. To get increased acreage of certain crops and compensate farmers for higher costs, incentive payments were used. A dairy subsidy payment plan, to encourage farmers faced with rising feed costs in the production of dairy products, became effective in 1944.

After the entry of the United States into the war, rising

prices aroused the fear of inflation and resulted in the passage of the Price Control Act of January 1942. Some farm products soon had a price ceiling over them as well as a price floor under them. However, no ceiling on agricultural commodities could be set at less than 110 percent of parity. Wholesale and retail food prices were frozen in May 1942. It soon became evident that processors were paying almost as much to the producers as could be charged for the finished product. Subsidies to millers, manufacturers of dairy products, and meat packers were the means adopted to remedy this condition.

The Price Stabilization Act of October 1942 provided that the Office of Price Administration could not set ceilings on farm products at less than the highest of either 100 percent of parity or the highest price between January 1 and September 15, 1942. Subsequent extensions of the act reiterated the protection for agricultural commodities. Ceilings, however, were not applied to live cattle until January, 1945. But even with price ceilings, the range within which farm prices were permitted to fluctuate remained rather wide.

Favorable price relationships and greater demand were not the only means relied upon to solve the problem of production adjustment in agriculture. A major attempt to guide the adjustment of livestock and crop production to wartime needs was made through the Department of Agriculture. Beginning in 1943, the Bureau of Agricultural Economics in cooperation with the Land-Grant colleges and other agencies made studies each year of desirable adjustments in agricultural production for the respec-

tive states. These studies were used by the Department of Agriculture in cooperation with State and County War Boards as a basis for formulating production goals for livestock and crops. As the goals were announced before planting and breeding time, farmers knew the kind and quantity of products needed in a given year to meet the demands of war and had an opportunity to fit their individual production patterns into the larger plan. The soil conservation program which had been in effect since 1938 was continued. In Kansas, efforts were made to discourage plowing of pasture land for the production of wheat which had proved so disastrous following the first World War. Through the Extension Service, farmers were instructed in methods to improve production and assistance was given in obtaining labor, machinery, and other tools of production. This work, although reminiscent of the part played by the councils of Defense in World War I, was on a much broader scale during World War II.

Even though regulations and restrictions during World War I and World War II were not comparable, the over-all pattern of change was similar in that production of crops was expanded and livestock numbers increased; the rise in domestic and foreign demand was reflected in higher prices for farm products resulting in a larger per capita share of the national income for agriculture.

### THE IMPACT OF THE TWO WARS UPON PRICES AND PRODUCTION OF SELECTED COMMODITIES

Prices of farm products do not rise overnight following the outbreak of a major war, but the increased demand for food and other raw materials is soon reflected in higher prices for most agricultural commodities. "Food Will Win the War", a slogan of World War I, has applied to many wars, and World War II was no exception. Food and other basic raw materials are needed in enormous quantities for the fighting forces. The government enters the market to buy the largest quantity of farm products purchased by a single buyer. Production must be stepped up. Price incentives are the tools nearest at hand to direct and stimulate the necessary production. Price increases, sanctioned and aided by governmental authority, have been used in agriculture more than any other industry to draw out the desired production.

Perhaps not as rapidly, but just as inevitably as war has brought price inflation, price deflation has followed in the postwar period, and farm prices have been the first to be affected. This has been the pattern of price behavior accompanying three major wars in the United States. On a graphic presentation of price movements, the War of 1812, the Civil War, and World War I stand out as three sharp peaks with the highest and sharpest of the three representing farm price changes during World War I.

Comparisons show that the average of prices received for all farm products in Kansas follow the same trends and vary only slightly from the average of farm prices of all commodities for the United States. The economic dislocations of the Civil War probably left a mark on the progress of the then youthful state of Kansas, but for the purpose of this study that period is too remote and data are too fragmentary. But at the onset of World War II there were still many Kansas farm operators in whose memories the unstable farm prices of World War I were only a few short yesterdays away. The brief span of years between the two world wars was a factor affecting economic conditions during World War II. It made possible the application of some firsthand experience in governmental price regulation gained in World War I to the larger problems generated by World War II. At the same time recollections of what happened to their businesses following World War I caused individual farmers to proceed more cautiously in expanding their operations during World War II.

The repeated references to price are not intended to foster the conclusion that this is a price study. Price was considered not so much for itself as for its relation to production. Obviously, the effect of price upon production is not instantaneous. In agriculture there is always a time lag between the establishment of a certain price level for a given commodity and the farmers' response to that level through production of the commodity. The physical volume of farm marketings

multiplied by price equals cash farm income. But, fundamentally, real income depends upon what is produced and how it is produced. Also, what Kansas contributed to the war effort can be determined in some measure by the record of physical production in agriculture. It was found that the effects of war on production and price could be visualized more readily by considering what happened to different commodities. Wheat, feed-grains, and the war needed oil crops were the crops examined; while meat animals, poultry and eggs, and dairy products were the livestock and livestock products analyzed.

#### Wheat

Kansas is by no means a one-crop state, but wheat more than any other crop is symbolic of the state's agriculture. With a long record of pre-eminence as a wheat producing state, Kansas has received the most recognition for the production of hard winter wheat. Some spring wheat is grown; but the soil, climate, and topography in central and western Kansas are well adapted to the raising of hard winter wheat. The yearly acreage seeded to this crop in Kansas is greater than that employed for the cultivation of any other crop. Briefly, wheat sets the pattern for crop production, is an important factor influencing livestock production, and usually furnishes more than one-half the total cash income that Kansas farmers receive from the sale of crops. Therefore, wartime fluctuations in the price and pro-

duction of wheat need to be given careful consideration in any appraisal of the state's agriculture.

During the five-year prewar base period of 1910-1914, the average production of wheat was approximately 90 million bushels; the acreage seeded to wheat during the same period averaged nearly 8 million acres. In 1914 a crop of approximately 180 million bushels was harvested. This remained the highest production on record until 1931, when the harvesting of more than 250 million bushels from 14 million seeded acres set a record for wheat production in Kansas that has not been surpassed. Since the outbreak of World War I in Europe did not occur until the late summer of 1914, the bumper wheat crop harvested in that year only can be attributed to favorable weather which resulted in an average yield for wheat of 19.9 bushels, the highest recorded yield for Kansas.

In using 1935-1939 as the base period for the examination of any of the effects of World War II on Kansas agriculture, certain characteristics of that base period must not be overlooked. Dry weather during 1934 reduced the production of wheat in 1935 to a little more than 64 million bushels. The wheat crop in 1936 escaped some of the damage of the severe drought which cut the production of feed and forage in that year to such a degree that livestock numbers declined sharply and remained at low levels throughout the rest of the period. This along with other factors combined to foster abnormal increases in the acreage planted to wheat in the base period. During 1935-1939, the

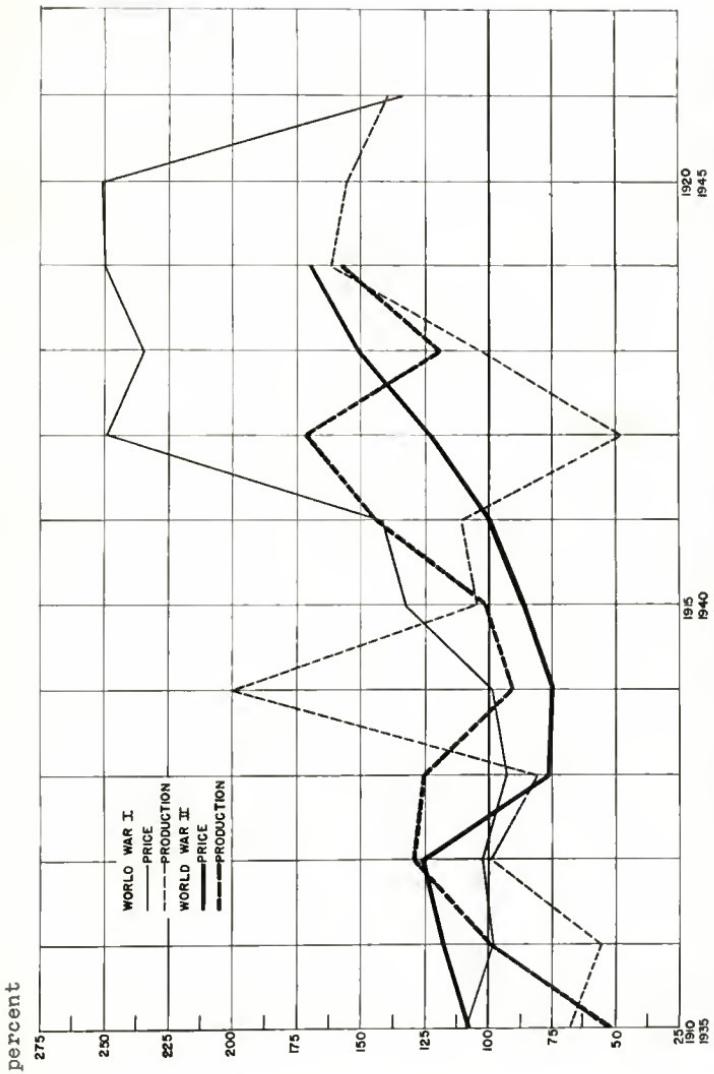


Fig. 1. Indexes of price and production of all wheat for Kansas. World War I (1910-1914 = 100) World War II (1935-1939 = 100).  
Source: Calculated from (9) and (10).

acreage seeded to wheat averaged, in round figures, 15 million acres with approximately 17 million acres seeded in 1937 and 1938. Compared with 1910-1914, the average acreage seeded to wheat was nearly twice as great during 1935-1939, but the production at 120 million bushels in the latter period was only one-third greater than during the base period for World War I.

Figure 1 shows price and production of wheat in Kansas for all of the phases of World War I and the prewar and the war period through 1944 for World War II. Absolutely and relatively, wheat production was much higher during World War II than compared to the war or immediate postwar period of World War I, but the opposite was true of wheat prices. If one factor and only one could be offered to explain the wheat production and price contrast between the two wars, differences in favorableness of weather would be the single explanation which might be given as the most all inclusive. There have been fluctuations in the wheat production cycle since 1939, but in no war year since did the production drop below the average of the base period. In 1942 it was 71 percent above the 1935-1939 average; while preliminary figures in 1945 indicate a total production of wheat 80 percent higher than the prewar average. During the second world war there was no parallel to the drought which in 1917 cut the wheat production so that in that year it was only 46 percent of the 1910-1914 average. In 1918 wheat production was only 3 percent above the average of the base period, but in 1919 the index was 161 or 61 percent higher than the average.

So the big increment in the physical production of wheat during World War I did not happen until the postwar period. Even though results did not show it, there was considerable expansion in the wheat production plant during the course of World War I. The acreage seeded to wheat in 1915 and 1916 was more than 12 percent above the prewar average and in the two years, 1917 and 1918, the increase in acreage averaged approximately 50 percent. Beginning in 1937 and continuing during the war years, the general trend of wheat acreage has been downward.

Examination of the price indexes for World War I as plotted on Fig. 1 helps to explain why acreage seeded to wheat expanded in spite of the adverse weather conditions. Prices of wheat were fairly stable during the base period of 1910-1914, but began to rise in 1915 reaching 249 percent of the prewar average in 1917, the year of the short wheat crop. This was the peak of wartime prices for wheat, but during the postwar years of 1919 and 1920, wheat prices averaged somewhat higher and the production indexes were more than 50 percent above the prewar average.

Wheat prices during World War II were characterized by a uniformity in rate of increase that can be attributed in a large degree to the government price control program of supports and ceilings for wheat prices. The contrast between the wartime price levels for wheat for the two wars visualized in Fig. 1 is more striking when it is understood that the average farm price of wheat in the base period of 1910-1914 was 84.2 cents and in

1935-1939 the average was 85 cents. After fluctuating widely in the prewar period, average wheat prices during World War II began to rise in 1940 and since have continued to advance steadily. But not until 1943, the war year of the lowest production, did wheat prices surpass the level which prevailed in 1937. By 1944 the index of average prices for wheat was 169, and for the first six months of 1945 the upward tendency was still evident.

#### Feed Grains

The major portion of the feed grains grown in Kansas is not sold as cash grain but reaches the market in the form of meat animals and livestock products which are an important source of cash farm income in Kansas. The supply and demand for feed grains affect the supply and demand for livestock and livestock products, and the relationship is just as true from the opposite direction. If the price of a certain kind of livestock is high in relation to the price of feed grains, it is more profitable for a farmer to feed his grain and sell the livestock than to sell the grain. The relationship of feed-grain prices to livestock prices is called a feeding-ratio. As the discussion of livestock and livestock products is presented in later sections of this study, it seemed best to limit this section to a brief outline of the feed-grain situation in the two wars and to consider feeding-ratios in the section devoted to livestock.

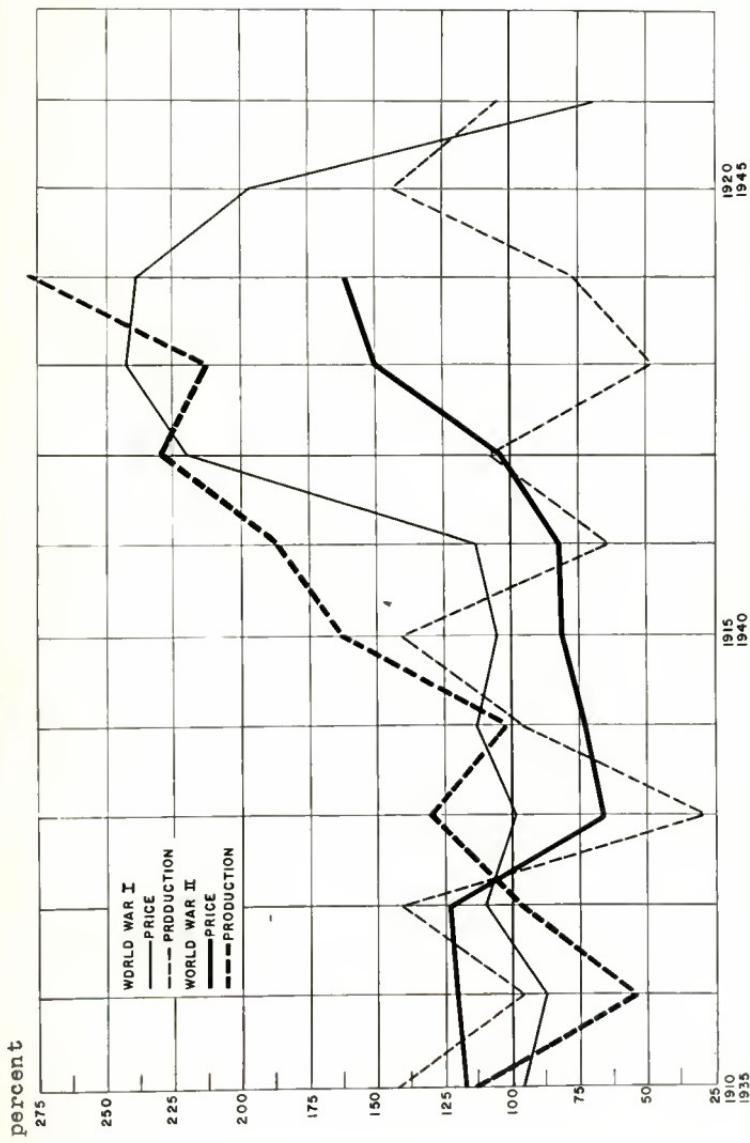


Fig. 2. Indexes of price and production of feed grains for Kansas.  
 World War I (1910-1914 = 100) World War II (1935-1939 = 100).  
 Source: Calculated from (9), (10), (11), and (14).

Normally, feed-grain production in Kansas is closely geared to the production of wheat. A large wheat acreage and a good wheat year indicate a smaller acreage of feed grains, but a year of high wheat abandonment means, at least, a larger acreage of spring feed crops if not a larger production. In other words, there usually has been an inverse ratio between wheat and feed-grain production and a direct ratio between livestock and feed-grain production. However, during World War II the feeding of wheat to livestock and the more extensive use of wheat pasture for cattle and sheep which results in the production of more meat per unit of feed fed tended to offset these relationships to some extent.

There were a number of factors causing important variations in the level of feed-grain production in the two prewar periods. The actual physical production of these crops was on a larger scale during 1910-1914 than it was during 1935-1939. Yields were about the same for both prewar periods but decreased acreage in 1935-1939 does not explain all the changes that were involved. Shifts in the pattern of feed-grain production as well as in the utilization of these crops began during World War I and continued in the period between the wars. Among the factors that have contributed to this change is the degree of mechanization that had developed throughout Kansas agriculture. In 1910-1914 the average number of horses and mules on Kansas farms on January 1 was 1,405 thousand head; in 1935-1939 the average was 532 thousand. So in the later period, the demand for feed-grain

to maintain one-half million work animals no longer existed, and even though the production of feed grains was lower, the supply in relation to meat animals was greater. Meat production per unit of feed has increased somewhat since the first World War due to earlier maturing animals and the tendency to feed cattle to lighter weights.

Another factor that helps to explain differences in the supply of feed grains between the two base periods is that corn, which is the heaviest factor in a feed production index, had been declining in importance as a Kansas crop since soon after the end of World War I. The production of grain sorghums, which have about 90 percent the feeding value of corn, had been increasing. Also, it must be recalled that growing conditions during part of the prewar period of World War II cut all crop production to such an extent that the resulting low average for feed grains might tend to foster the impression that the supply of these crops during World War II was large enough to meet the demand. There were times when the supply of feed tended to check the expansion of livestock production.

The composite indexes charted in Fig. 2 represent prices and production of corn, oats, barley, and grain sorghums. Prices were weighted according to the relative importance of the physical volume of production of each crop during the base period. For the production indexes, the physical volume of production of each crop was converted to the feeding value of the crop as compared to corn; the resulting figures were added to form the composite totals used as a basis for the index numbers of feed-

grain production.

As shown in Fig. 2, feed-grain production fluctuated from year to year with no really marked changes that would indicate that production was diverted from its normal course by the effects of the war during any of the phases of World War I. The index of production at 141 in 1915 was not surpassed until the postwar year, 1920. The only other wartime year that the production was above the base period average was in 1917, a year of high wheat abandonment and low wheat production. Relative to the base period of 1935-1939, the indexes of feed-grain production show that substantial increases occurred during World War II with the indexes of feed-grain production standing above 200 during the last three years of the period under consideration. Part of the explanation of this stimulated production has to do with meat shortages relative to the demand for livestock during World War II. Also, among the major reasons for expanded production during recent years was the favorable crop growing weather that resulted in higher yields for feed crops.

On the average, farmers received higher prices for feed grains during World War I than during World War II, but unlike most World War I prices, the peak occurred in 1918 and not in the postwar period. In 1917, the year of most rapid price rises, the price indexes had advanced from 115 to 220 and went up another 20 points in 1918. The average was slightly lower in 1919 and by 1921, the price index of feed grains was 32 percent below the base period average.

Feed-grain prices were at a low level in 1940 and 1941, and did not rise above the base period average until 1942. During 1943, large increases in feed-grain prices brought the index to 151. The tendency for feed-grain prices to rise continued in 1944 with the index for that year at 161.

#### Oil Crops

The dramatic rise in the production of the oil crops--flaxseed and soybeans which occurred during World War II is pictured graphically in Figs. 3 and 4. Most of the flax now grown in Kansas is found in the southeastern part of the state, while soybeans, although best adapted to the eastern one-third, have spread to almost every county in the state under the recent stimulus of wartime demand. Flax was cultivated in about the same proportion in both of the prewar periods, but soybean cultivation in Kansas was unknown during World War I and of relative insignificance during the prewar period of World War II.

In only one year during World War I did the acreage seeded to flax approach and the production of flaxseed exceed the 1910-1914 average. That was in 1917, a year of high wheat abandonment, which led to the planting of a larger acreage of spring crops among which was flax. Although 1939 was generally recognized as a bad year for crops, the production of flaxseed increased substantially and continued to rise except for a slight

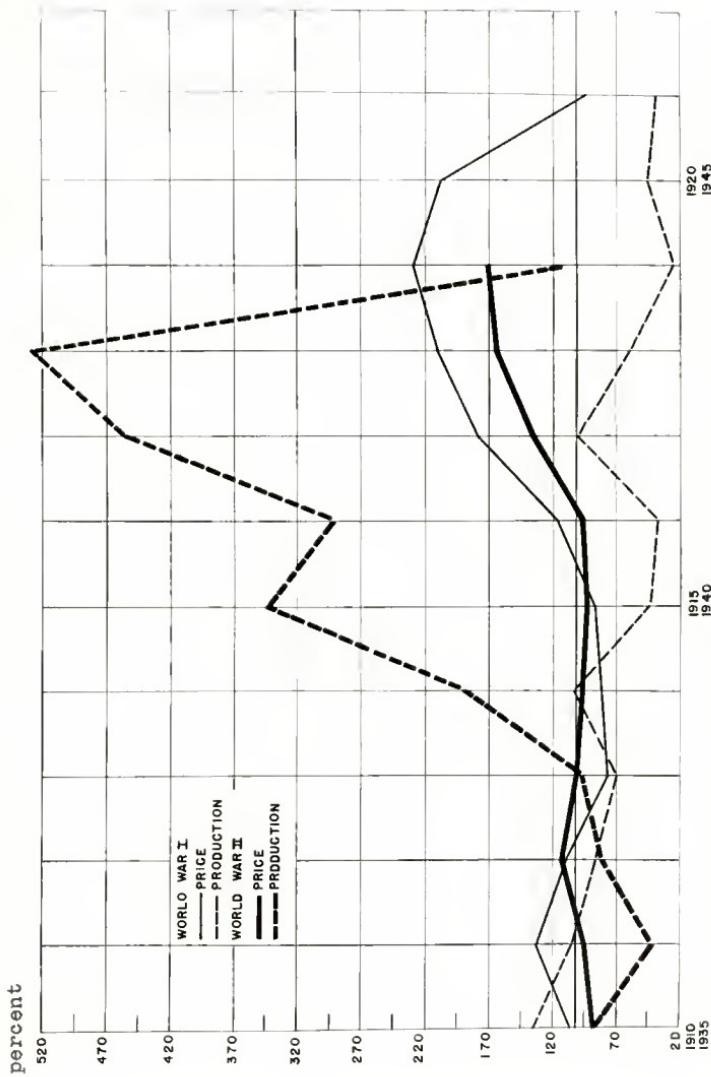


Fig. 3. Indexes of price and production of flaxseed for Kansas. World War I (1910-1914 = 100) World War II (1935-1939 = 100).  
Source: Calculated from (9) and (10).

setback in 1941 until 1943, the peak year of wartime production. The low production in 1944 is explained in part by the cool wet spring of that year which prevented the seeding of the flax acreage which normally might have been planted. Also, Kansas farmers were beginning to realize that the demand for flaxseed as a source of vegetable oil was not strong enough to overcome the difficulties encountered in its production. The index of flaxseed production in 1943 was 527; in 1944 it was 116.

The story of soybean production as illustrated in Fig. 4 is somewhat deflated by the information that during the prewar period the acreage seeded to soybeans averaged a little more than 22 thousand acres and the production a little less than 50 thousand bushels. But even though the base figures were low and the increase in the position of soybeans as a Kansas crop is more relative than absolute, it is the one crop that is an outstanding example of how production patterns can be altered to meet an urgent wartime need. The largest expansion in acreage and production of soybeans was in 1942, chiefly, because wet weather in the fall of 1941 restricted wheat planting. In 1944 acreage seeded to soybeans exceeded 300 thousand acres and the production was more than three million bushels. The cash value of the crop for the five years before the war averaged less than \$60,000; in 1944 it was approximately \$5,000,000.

Prices of flaxseed as shown in Fig. 3 were comparatively stable during the base periods of both wars with the average

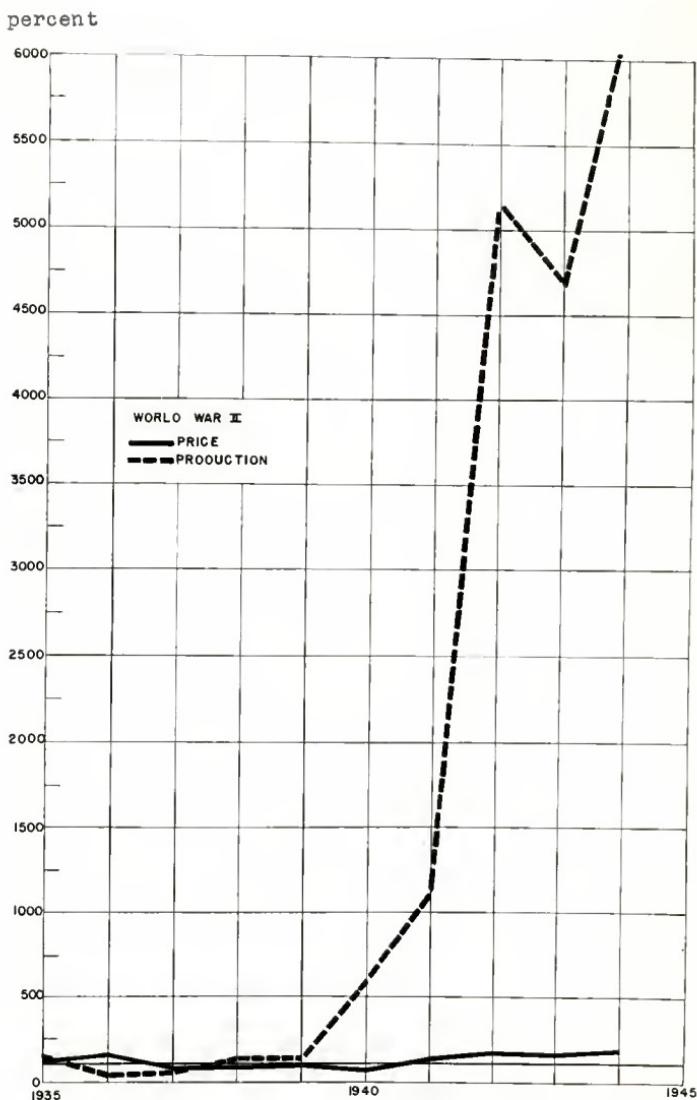


Fig. 4. Indexes of price and production of soybeans for Kansas. World War II (1935-1939 = 100).  
Source: Calculated from (9), (10), and (14).

farm price for 1910-1914 at \$1.56 per bushel. This price was only two cents less than the 1935-1939 average. Almost the same pattern of price increase accompanied the two wars, but the level of prices for flaxseed during World War I was higher than it was during World War II. The wartime demand for flaxseed first became apparent in 1916 when the index of average farm prices stood 17 percent above the base-period average. Rising still more in 1917, the index reached 178. But the peak prices for flaxseed were not attained until postwar 1919 when an average yearly farm price of \$3.57 per bushel raised the price index to 229. In 1920 there was a slight drop in flaxseed prices which was accelerated during 1921 so that the index for that year was 93.

As has been previously mentioned, production of flaxseed began to rise in 1939, and for that crop and the succeeding crops until 1942 prices remained below the 1935-1939 average. For the 1942 crop, the government support program for the non-basic commodities which included flaxseed and soybeans was in effect. The loan rate for No. 1 flaxseed at Kansas City was \$2.35 per bushel and the Kansas farm prices reflect the influence of that price being 36 percent above the base period average. Since 1942, flaxseed prices have continued to rise, but the increases have followed closely the government price control program as applied to flaxseed.

Figure 4 shows that in 1940 production of soybeans was up, and following the normal pattern for price behavior, prices

were down. By 1941 the impact of the wartime demand for fats and oil was reflected in higher prices and production of soybeans. The government price support program for soybeans was effective for the crop of 1942 and the index of prices was 52 percent above the prewar average. The slightly lower average prices for soybeans in 1943 can be explained for the most part by the more rigid grading system applied in that year to soybeans under the price support program. Price ceilings for soybeans were authorized in 1944, and the index at 163 found soybean prices averaging close to the ceiling level.

#### Meat Animals

Livestock production in Kansas outranks crop production as a source of cash farm income, but each owes its importance to the other. Illustrating this interdependence is the fact that by utilization as livestock feed, much of the feed grain, hay and other roughage, as well as the pasturage from approximately 18 million acres of native grassland finds a market. And, in turn, the livestock population could not be maintained profitably at the levels that have prevailed if an abundance of feed and forage were not produced in the State. Also, by supplementing his wheat or other crop enterprise with livestock enterprises, the Kansas farmer makes the most efficient use of his labor supply.

Receipts from the sale of livestock and livestock products

in the last 20 years averaged more than one-half the total cash income received by Kansas farmers. More than two-thirds of the income from livestock and livestock products can be attributed to the meat animals--cattle, hogs, and sheep. Of the three species, cattle have been credited with the largest share of cash income from marketings of meat animals and in 1943 Kansas ranked third of all the states in production of cattle and calves.

Closely related to the variations in the crop production pattern of the two prewar periods were the shifts in the pattern of meat animal production. According to estimates of the number of meat animals on farms January 1, cattle averaged 2,770 thousand head for 1910-1914 and 2,862 thousand head for 1935-1939; hogs averaged about 50 percent less in 1935-1939 than in 1910-1914; and the average number of sheep on hand in 1935-1939 was slightly higher than in 1910-1914. The declining importance of corn as a Kansas crop is one of the factors which helps to explain the decrease in hog numbers in the late 1930's, but hog production in Kansas always has tended to fluctuate more than the production of either cattle or sheep. Increased emphasis upon wheat production with the resulting larger acreage of wheat pasture undoubtedly contributed to the slight upward tendency of sheep and cattle numbers in 1935-1939.

Indexes of meat animal prices and production in so far as it is indicated by the physical volume of marketings during the two wars are shown in Fig. 5. Obviously, a composite index

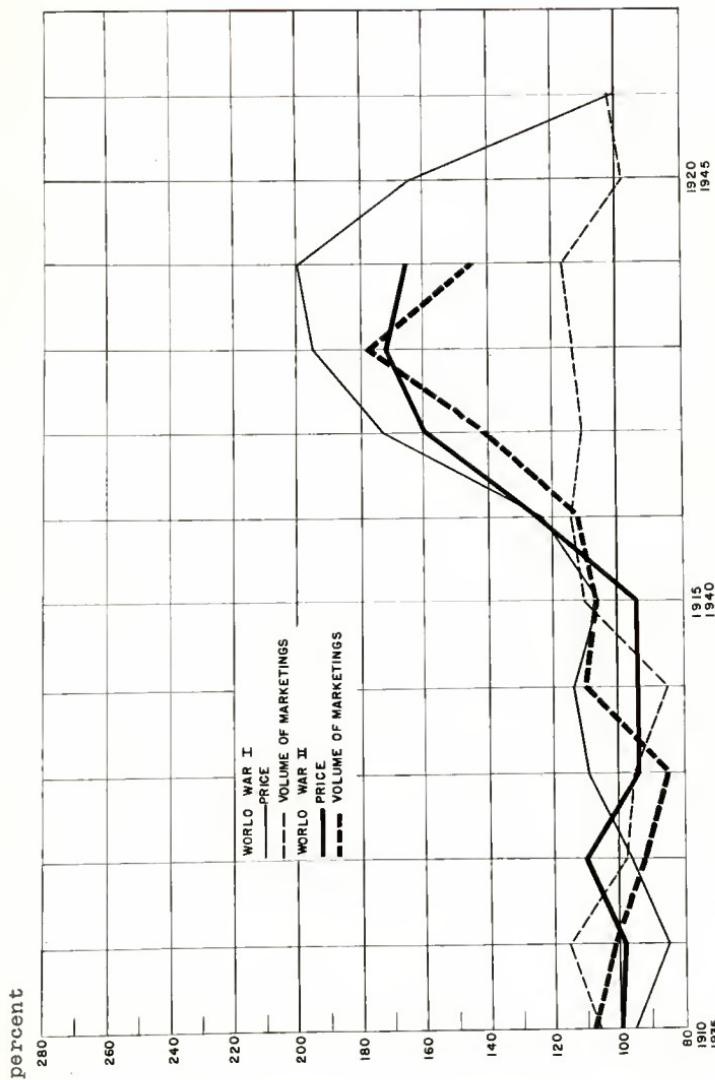


Fig. 5. Indexes of price and physical volume of marketings of meat animals for Kansas. World War I (1910-1914 = 100) of 1939 = 100).

Source: Calculated from (12), (14), and (16).

does not take into account the variations between the individual commodities. In other words, prices and production for the three species of meat animals do not move always in the same direction at the same time. Hog production received the greatest stimulus during both wars and sheep production went up more rapidly during World War II than cattle production, but the heavier weight of cattle in the composite indexes tends to level off the increases in both price and production of the other commodities.

The average of the volume of marketings for meat animals during 1910-1914 was approximately five percent greater than during 1935-1939. But this difference in the base period averages was not enough to minimize the sharp contrast in the production levels of the two war periods. As was mentioned in the discussion of feed grains, feeding ratios, i. e., the relation of livestock prices to feed prices, are important factors influencing livestock production. As a whole, grain prices in relation to prices for meat animals were much higher during World War I, therefore more grain was sold than fed. During World War II, feed grain prices were relatively low until 1943. The hog-corn ratio was most favorable in 1942 with the result that hog numbers on January 1, 1943, were estimated more than 40 percent greater than for the previous year and marketings of hogs for 1943 were nearly twice as great as the prewar average. The beef steer-corn price ratio was favorable in both 1940 and 1942, but the peak of the volume of marketings of cattle did not occur until 1943. In that year the index for volume of marketings for

all meat animals was 79 percent above the 1935-1939 average. During the World War I period, volume of marketings of meat animals was 10 percent above the prewar average in 1915 and until 1920 the indexes of volume of marketings were above the 1910-1914 average. But in 1919, the year showing the highest volume of marketings, the index was only 117. As has been previously stated, this wide difference in the physical volume of marketings of the two war periods can be explained most satisfactorily in terms of the more favorable feeding ratios that were evident during most of World War II.

The lower production figure for meat animals in 1944 was due to the rising prices for feed and the resulting less favorable feeding ratios which in 1943 were only slightly above the prewar average and in 1944 were below the prewar average. Good wheat pasture in the fall of 1941 and 1942 influenced the increased production of sheep in 1942 and 1943. Reflecting lack of wheat pasture in the fall of 1943, sheep numbers in Kansas were down more than 35 percent on January 1, 1944, as compared to the previous year, but the number on January 1, 1945 at 1,444 thousand head was not greatly below the inventory figure for the peak year, 1943.

As can be noted in Fig. 5, the similarity in the patterns of price behavior of meat animals during the two wars is as striking as the contrast in the levels of the volume of marketings for these commodities during the same periods. The average of meat animal prices was approximately 19 percent higher in

1935-1939 than in 1910-1914. This is not apparent in Fig. 5, because of the use of the two prewar base periods. During 1935-1939 meat animal prices were highest in 1937 and reached their lowest point in 1938 and 1939; while in 1910-1914 the high point was in 1914 and the low in 1911. During 1915 increased marketings of meat animals were accompanied by lower prices. By 1916 prices of meat animals were rising, but although the peak prices were not reached until 1919, the largest price increases occurred in 1917, the year the United States entered World War I.

Prices of meat animals in 1940 continued to be no higher than in 1939, but in 1941 these prices averaged 24 percent above the 1935-1939 average. In 1942 meat animal prices went up most rapidly with an average price index of 160 for that year. Supplies of meat in relation to the demand continued short. To combat this situation, ceilings on wholesale prices of pork were set up in May 1942 and were followed by the same type of price ceilings for wholesale cuts of beef in December 1942. In an effort to reduce the demand and promote a more equal distribution of the available supply, point rationing of meat went into effect on March 29, 1943. But it was not until late in 1943 that ceilings were placed upon the prices of live hogs. These devices combined with other factors to slow the rate of increase of meat animal prices so that in 1943 with the index at 172 it was only 12 points above that of the previous year. However, Kansas farm prices showed average meat animal

prices for 1943 to be the highest on record. The yearly average price per hundred-weight was \$12.63 for beef cattle, \$13.72 for hogs, and \$13.68 for lambs. It must be noted that the prices quoted do not show the range in price among the different grades of the species considered. In other words, some grades of beef cattle might have been higher than \$12.63 while at the same time other grades might have been much lower, so the \$12.63, \$13.72 or \$13.68 merely represent the average price of all beef cattle, sheep, or lambs, respectively, sold in 1943.

The full effect of the government program to roll back the prices of meats was not felt until 1944. Then, even though the volume of marketings for meat animals was considerably less, the index of meat animal prices at 166 was six points below the index for 1943. But a preliminary average based on indexes of price received during the first eight months of 1945 suggested that meat animal prices for 1945 will rise above the record established in 1943. Briefly stated, it can be said that relative to the base period averages, meat animal prices were not as high during World War II as during World War I. While absolutely, on a dollar and cents basis, average farm prices for livestock classed as meat animals were in 1943 above the top price average of World War I which was in 1919, were only two percent below this figure in 1944, and probably will be considerably higher in 1945.

## Dairy Products

Dairying in Kansas holds a relatively minor position from the standpoint of cash farm income, but almost every Kansas farmer keeps a few milk cows, for he has found that in time of stress sales of cream have been one of his most reliable sources of ready cash. Out of a total production of 3.3 million pounds of milk in 1943, 56 percent was marketed as sour cream, and in that year and also in 1942, Kansas ranked fourth among the states in the production of this commodity. According to Hodges and others (4) there are comparatively few commercial dairy herds in the state, and about two-thirds of the milk is produced in herds of less than 10 cows. Of the total cash farm income in 1944, only nine percent or approximately 64 million dollars came from the sale of dairy products. Thus dairy enterprises are used most often in Kansas as a supplement to crop or other livestock enterprises.

Figure 6 shows prices of dairy products and volume of marketings for Kansas during World War I and II. Although the average number of cows was only 15 percent greater in 1935-1939 than in 1910-1914, the level of production for dairy products as indicated by volume of marketings averaged approximately 80 percent higher for the five years preceding World War II than for the prewar period of World War I. This suggests the improvement in average rate of production per cow

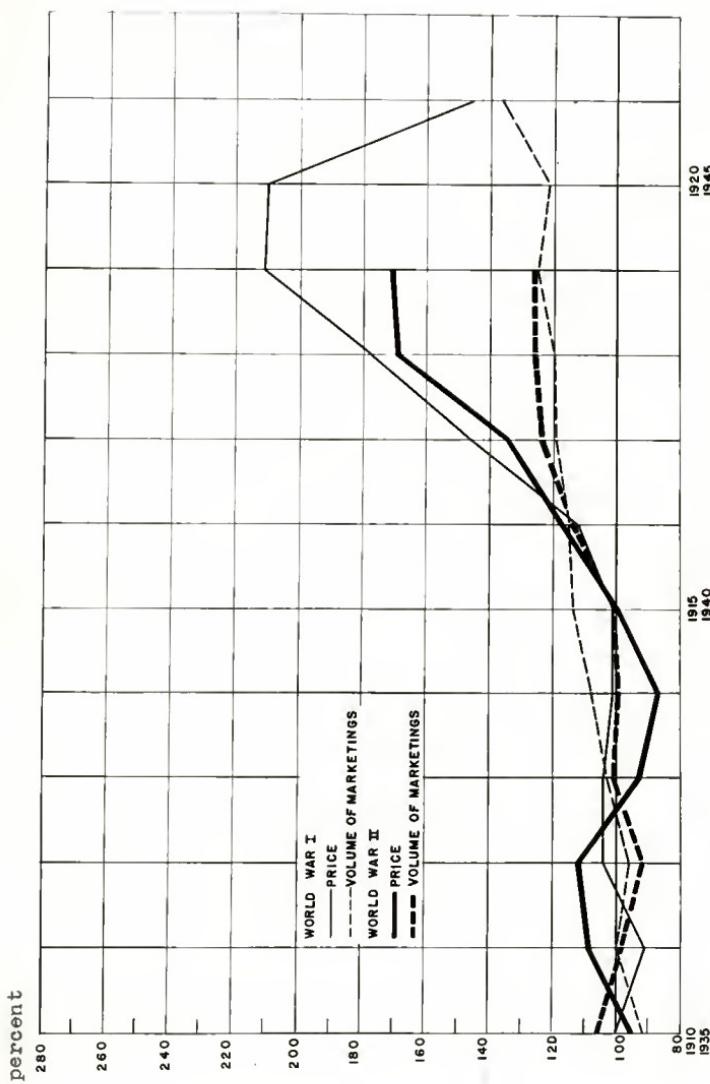


Fig. 6. Indexes of price and physical volume of marketings of dairy products for Kansas. World War I (1910-1914 = 100) World War II (1935-1939 = 100).

Source: Calculated from (12), (14), and (16).

as well as the development in the market for dairy products that occurred in the interval between the wars. Of all the agricultural enterprises, dairying is the least responsive to changes in demand and has the slowest rate of expansion. It takes several years to raise a dairy cow to maturity and full production. Some indication of this can be seen in Fig. 6 when the volume of marketing indexes for World War I did not reach their peak until 1921, while the highest prices for dairy products were in 1918, 1919, and 1921.

As with the other livestock enterprises, feeding ratios affect the production of dairy products. On a given farm with feeding ratios of equal favorableness for dairying and hog production or dairying and beef cattle production, the enterprise other than dairying is more often the one that will be expanded. For the most part this is due to the fact that in dairy enterprises there is a lower return per unit of labor expended than for the other livestock enterprises. Also, the other enterprises may be expanded more rapidly.

Both the butterfat-feed price ratio and the milk-feed price ratio were most favorable in 1941, and in that year volume of marketings for dairy products at 15 percent above the base period average made their largest percentage gain during World War II. These ratios were somewhat less favorable in 1942, fairly favorable in 1943, and quite favorable again in 1944, especially the milk-feed price ratio. In 1942 with the index at 124, the rate of increase in volume of marketings was not so

rapid as in 1941, and volume of marketing indexes leveled off at 126 for 1943 and 1944. Effective in the fall of 1945, the subsidy payments to dairymen were an attempt to encourage production in the face of rising feed costs and at the same time to slow down increases in the consumer price of dairy products. Relative to the base period averages, there was little difference in the average volume of marketings of dairy products for the two war periods, but the actual physical production of dairy products was almost twice as great during World War II as during the World War I period.

The average price of all dairy products was 17 percent higher in 1935-1939 than in 1910-1914. Considering this in reference to Fig. 6, it is not difficult to see that prices of dairy products during World War II, until halted by price control measures in 1944, were rising almost as rapidly as those prices rose during World War I. The index of dairy product prices was 163 in 1943 and only three points higher in 1944. During World War I, prices of dairy products were at their peak in 1919 when the price index was 211. It was 210 in 1920, but only 144 in 1921. Actually as well as relatively, prices for dairy products were not as high during World War II as during the World War I period.

## Poultry and Eggs

Poultry raising outranks dairying in popularity as a side line enterprise on Kansas farms, and the hen like the cow contributes substantially to the support of the farm family. The major portion of the poultry and egg production of the state is from farm flocks of chickens which normally average less than 150 birds. These small flocks furnish a steady income, yet require little of the farm operator's time since much of the work is done by other members of the farm family. Because of the type-of-farming and accessibility to urban markets, more poultry is kept and the heaviest production is from central and northeastern Kansas.

Of all the livestock enterprises, poultry can be expanded or contracted the most rapidly. In 1935-1939 sales of chickens and eggs averaged 7.9 percent of the estimated average total cash income, while in 1944 slightly more than nine percent was attributed to the same sources. Although turkey raising is among the poultry enterprises which have been expanding in recent years, it still adds only a small percent to the cash income credited to poultry production in Kansas. In 1944 about 64 million dollars came from sales of chickens and eggs, while a little more than four million dollars was the cash return from turkeys marketed in the same year. An average of about two-thirds of the receipts from chickens is from the sale of eggs. However, during the last few years, the average has been nearer

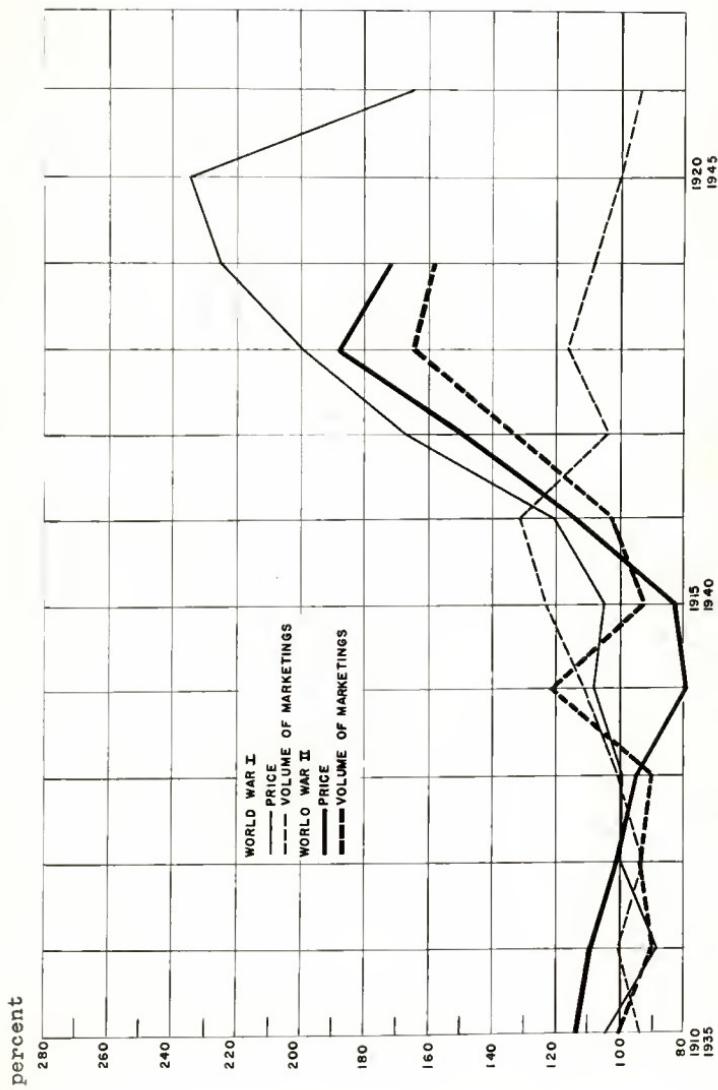


Fig. 7. Indexes of price and physical volume of marketings of poultry and eggs for Kansas. World War I (1910-1914 = 100). World War II (1935-1939 = 100).  
Source: Calculated from (12), (14), and (16).

three-fourths than two-thirds. Approximately 55 million out of almost 73 million dollars of cash income from poultry in 1943 was from the sale of eggs. The rate of egg production per hen has advanced steadily since World War I. According to Hodges and others (4) the rate of lay per hen has increased from 80 in 1925-1935 to about 115 in 1941-1943. If the egg-feed price ratio is favorable, the poultryman increases both the size of his flock and the rate of egg production. The latter is accomplished by heavier feeding.

Indexes of prices and volume of marketings for poultry and eggs during the two world wars are presented in Fig. 7. Since poultry and egg production was quite low in 1935-1939 compared to that of the 1920's, there probably is little difference in the average volume of marketings for these commodities in 1935-1939 and in 1910-1914. As can be noted in Fig. 7, the poultry industry in Kansas was not greatly stimulated by the wartime demands of the first world war. After a slow rise beginning in 1914 and reaching its peak in 1916 with the index at 131, volume of marketings for poultry and eggs was quite depressed in 1917, up somewhat in 1918, and declining in the last three years of the World War I period. This limited response to the high prices that prevailed in those years can be explained by the shortage and resulting high prices for grain which hindered expansion of livestock enterprises. In other words, feeding ratios for poultry were so unfavorable in most of the World War I period that in spite of steadily advancing prices the production

of poultry and eggs was relatively unprofitable.

Compared to the prewar period, the egg-feed price ratio during World War II was most favorable in 1942; it was fairly favorable for both 1941 and 1943; but by 1944 rising grain prices and over-expansion of livestock numbers caused the ratio for that year to be extremely unfavorable. But advantageous feeding ratios were not the only explanation for the rapid rise in the volume of marketings of poultry and eggs in 1941, 1942, and 1943. Probably the greatest impetus given to the production of poultry for meat came in March, 1943, when poultry was not included on the list of meats placed under point rationing.

Although volume of marketings for poultry and eggs started upward in 1941, the greatest expansion in production occurred in 1943, with the volume of marketing index for that year 65 percent above the base period average. By January 1, 1944, the estimated number of chickens over three months old on farms was 44 percent above the 1935-1939 average. This rapid expansion in number of hens along with other factors favoring increased egg production resulted in a large surplus of eggs late in 1943 and early in 1944. To keep egg prices from falling below the support levels in many areas, the government purchasing agency for surplus commodities had to enter the market to buy large quantities of eggs. Considerable reduction in poultry numbers occurred in 1944 so that by January 1, 1945, the estimated number of chickens over three months old on farms was only 22 percent above the 1935-1939 average. This decrease in

numbers coupled with unfavorable egg-feed price ratios reduced egg production in 1944 so that the volume of marketing index for poultry and eggs at 150 was lower than it had been in 1943.

Considering the fact that the average of farm prices for poultry and eggs was five percent higher in 1935-1939 than in 1910-1914, there is close similarity, at least as far as 1943, in the behavior of poultry and egg prices in the two war periods as plotted in Fig. 7. During the World War I period, peak prices for poultry and eggs were in 1920 with the index for that year at 235. In 1921 prices of poultry and eggs dropped so that the index for that year was 164. Poultry and egg prices were at a relatively low point in 1940, but steady advances in 1941, 1942, and 1943 brought the index for the latter year to 188. With 1943, the year of top poultry prices during World War II, the actual average farm prices for chickens and eggs in Kansas were only a few cents below the averages received in 1918. But in 1944 both real and artificial price controls operated to cause lower prices for poultry and eggs so that at 172, the index of prices for these commodities was below the record of the previous year.

FINANCIAL ASPECTS OF THE EFFECT  
OF TWO WARS UPON KANSAS AGRICULTURE

Cash Farm Income and Wages to Hired Labor

Cash farm income in Kansas made spectacular and strikingly similar gains during both wars, but as is quite apparent in Fig. 8, it rose much faster and to a greater height during World War II. The average estimated cash farm income for 1935-1939 including Government payments in Kansas was approximately 288 million dollars. In 1940 the estimated total cash farm income for the state was one percent below the prewar average. Cash income was up 46 percent in 1941; 110 percent in 1942, the year of largest increase; and in 1943 reached the wartime high of approximately 755 million dollars or 162 percent above the base average. Volume of marketings in Kansas for 1944 averaged 10 percent below the level of 1943, and this accompanied by a 40 percent decline in Government payments put the index of cash farm income at 244. Although in 1944 the estimated total cash farm income for Kansas at slightly more than 703 million dollars was well below the level of 1943, it exceeded by almost 100 million dollars all other war and peacetime records for the state. Preliminary income reports for this year suggest that total cash farm income for Kansas in 1945, while not a serious threat to the record of 1943, may surpass that of 1944.

The greatest increase in cash farm income during World War I

was from 1917 to 1918 with the index for the later year at 234, however, 1919 was the peak year for cash receipts in that period with the index at 245, and the estimated total cash farm income running somewhat below 600 million dollars. Cash receipts in 1920 were near the level of 1918 and by 1921 only 54 percent above the 1910-1914 average. The average cash farm income of 1910-1914 in Kansas was about five percent below the average of 1935-1939. This percentage difference was low compared to income figures for the United States during the two periods. However, it should be remembered that relative to the record for the United States, both production and prices were low in Kansas during 1935-1939. Too, as previously has been mentioned, there is some margin of error in the cash income figures as estimated for the World War I period, and the income probably was overestimated rather than underestimated. Thus the margin between the two levels of income possibly was greater than is shown in Fig. 8.

Some shift in the relative importance of crops and livestock as sources of cash farm income in Kansas were noted in the two periods under consideration. Crops were furnishing a larger percent of total cash farm income in the World War I period than during the prewar or war period of World War II, and the opposite is true for livestock and livestock products. Although the levels of both livestock and crop production were higher in the later period, livestock receipts had risen faster than crop receipts.

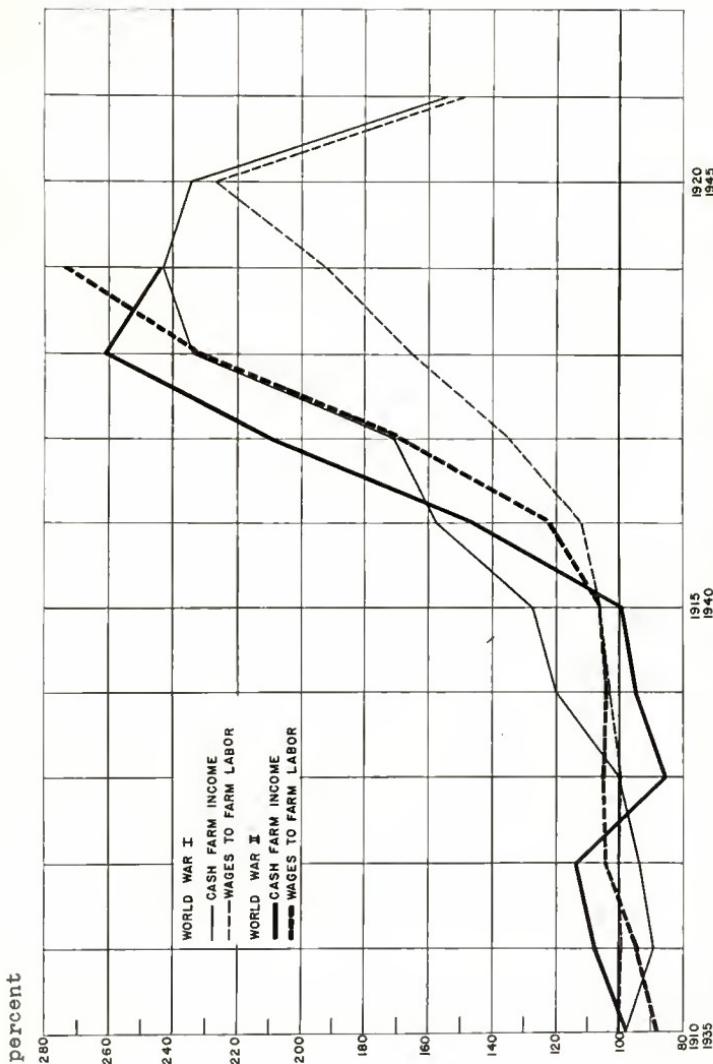


FIG. 8. Indexes of cash farm income from marketings and wages without board paid to hired farm labor for Kansas. World War I (1910-1914 = 100)  
World War II (1935-1939 = 100).

Source: Calculated from (10), (12), (14), (16), (17), and see note page 100 of manuscript.

Since cash farm income is the product of the physical volume of marketings of agricultural commodities multiplied by prices received by farmers, an increase in the income from one year to the next may indicate a larger volume of marketings with no change in price, the same volume at a higher price, or increases in both volume and price. The parts played by price and production in creating the higher cash incomes during the two war periods were quite different. During World War II, volume of marketings had the major role and prices a minor part, while in the World War I period prices were more responsible than volume for bringing increases in cash receipts. For the World War I period of 1915-1920 in Kansas, the estimated average of volume of marketings for all farm commodities was only about 10 percent higher than the 1910-1914 average, but prices for the same period averaged 75 percent above the prewar average. During World War II for 1940-1944 in Kansas, volume of marketings averaged 43 percent and prices 34 percent above the 1935-1939 average.

In a given year some indication of the return to capital, labor, and management engaged in agriculture can be gained from the estimated total cash farm income for that year. However, it must be recognized that cash farm income is reduced neither by the costs of farm operations nor is it augmented by the value of any of the commodities grown on the farm and consumed by the farm family. It is the total amount of money received from the sale of farm products, therefore it is much higher than net income. While total cash farm income was increasing during both

world wars, the farm population was decreasing so that the per capita return to agriculture advanced faster than could have been accomplished by the rise in income alone. Comparing Census figures for 1910 and 1920, the farm population in Kansas in the later year was more than 11 percent below the figure for 1910; the share of cash farm income per capita in 1910 was \$290 and \$784 in 1920. The average of the estimated farm population in Kansas for 1935-1939 was 656 thousand persons; by 1944 the farm population<sup>1</sup> was estimated to have declined 25 percent from the prewar average. In 1943 and 1944 the per capita cash farm income was nearly three times greater than the \$439 average of 1935-1939. The flow of cash income into the hands of the farm population of Kansas during the last war has had no parallel in the history of the state.

Wages paid to hired farm labor especially in wartime tend to follow the upward movement of cash farm income. However, as is noticeable in Fig. 8, wage rates in Kansas did not rise as fast in either war or in the case of World War I to so high a level as cash farm income. In 1944 during World War II, cash farm income declined, while wages of farm labor continued to advance. In that year wages at 175 percent above the average rate of 1935-1939 had made a greater relative increase during World War II than cash farm income. Although cash farm income largely determines the farmers' ability to pay a given wage rate

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<sup>1</sup> Estimates of Regional B. A. E. Office, Lincoln, Nebraska.

and even though demobilization has been extensive, farm labor has continued to be scarce, and it is likely that the average wage will not be lower for 1945. Normally, the downswings in wage rates lag behind cash farm income in the same manner as the upswings. This is illustrated by what happened to wages and income in 1920 and 1921. In the former year farm-wage rates were at their highest being 127 percent above the average of 1910-1914, yet in 1920 cash farm income had started on the downgrade. By 1921 both farm wages and income dropped sharply.

Comparing wage rates during the two wars it is readily seen on Fig. 8, that farm wages in Kansas went up more rapidly and to a higher level during World War II. There is only a few cents' difference in the yearly average of the monthly wage rate without board during the two prewar periods. It was approximately \$34 per month in each period. The average monthly farm wage without board was \$93.44 in 1944 and \$77.50 in 1920.

Several factors have combined to foster the above-mentioned increase in farm wages. The wartime drop in the farm population touched all groups, but the wage workers being the most mobile group move readily into other employments, therefore it is this group which showed the greatest decline in numbers. According to estimates of Hill (3) of the Bureau of Agricultural Economics, the number of hired farm workers in 1944 for the United States was 13 percent below the 1940 average. Since the farm population in Kansas had declined faster than that of the United

States, it is likely that the drop in farm wage workers in this state was greater than for the United States. Farmers in order to obtain the hired help they needed were forced to pay wages high enough to compete with those paid by other industries. As long as a farmer's cash income is rising faster than his other costs of operation, he is able to meet demands for higher wages. Income rose in the last few years chiefly because of increased production. So with production increasing and workers decreasing there has been an increase in output per worker in agriculture which is another reason why higher wages can be paid.

It is estimated that output per worker in agriculture in the United States last year was 45 percent above the 1935-1939 average. Evidence available for Kansas indicated an even greater increase in output per worker. Unpublished data by type-of-farming areas from the Farm Management Association farms in Kansas showed percentage increases in crop acres per man for 1944 varying from 21 to 48 percent above the 1939 average, and at the same time livestock production was much above the prewar level. Per capita volume of marketings even using the total farm population of Kansas were twice as great in 1944 as for 1935-1939. If figures for the average number of farm workers had been available for the periods considered, the comparison would have shown a still higher production per worker for Kansas. How much of this higher output per worker was due to favorable weather and longer hours of work would be difficult to measure, but increased efficiency of the laborers as

well as in the use of labor and labor-saving machinery should be included in the explanation. It is generally recognized that during periods of depression many persons seek refuge on farms so that during such times there is considerable under-employment of the farm population. So whether or not the improved efficiency of the farm labor supply will continue after the war depends largely on business conditions in general.

Wages paid to hired labor reflect part of the cost of farm operations as well as the income received by a portion of the farm population. Extensive mechanization and the prevalence in Kansas of the family-sized farm where the labor supply consists for the most part of the farm operator and his family tended to keep wages to hired labor a relatively small percent of the cost of farm operations and a minor item of income for the total farm population. In the early 1930's the low wage scale of hired farm workers was a subject of public concern. Government efforts in 1945 to stabilize farm wage rates by means of ceilings suggest that the problem now was being approached from the opposite angle.

#### Farm Real Estate and Farm Mortgage Debt

The wartime rise in farm incomes resulting from mounting prices and production of agricultural commodities furnished pressure for the upsurge in land values accompanying both world wars. The upswings in income and farm real estate values do

not occur simultaneously. There is a time lapse of from one to two years before an increase in farm income is reflected in higher values for farm land, and on this basis there is close correlation between changes in income and land prices. As has been previously mentioned, the largest yearly increase in cash farm income in Kansas during World War I was in 1918 (Fig. 8) when the index of cash farm income went up 64 points from the index of 1917, while it was not until the year between March 1, 1919, and March 1, 1920, (Fig. 9) that the biggest yearly gain was recorded for farm real estate values. Similar examples of the lag between changes in income and real estate values can be noted by comparing these indexes for World War II as shown on Figs. 8 and 9.

The real estate situation in Kansas varied considerably in the two prewar periods, and an outline of these differences is a necessary prelude to a comparison of the movements of real estate prices during the two world wars. The three years, 1912-1914, used as the prewar base for real estate values in World War I, saw but a continuation of a general rise in land values that had been building up since 1900. This period was characterized by an exceedingly optimistic concept of the value of land. Since it was generally recognized that most of the productive land had been claimed by this time, it was thought that with an increasing population the point soon would be reached when land would be scarce and, therefore, dear. It was thought by many persons that in time

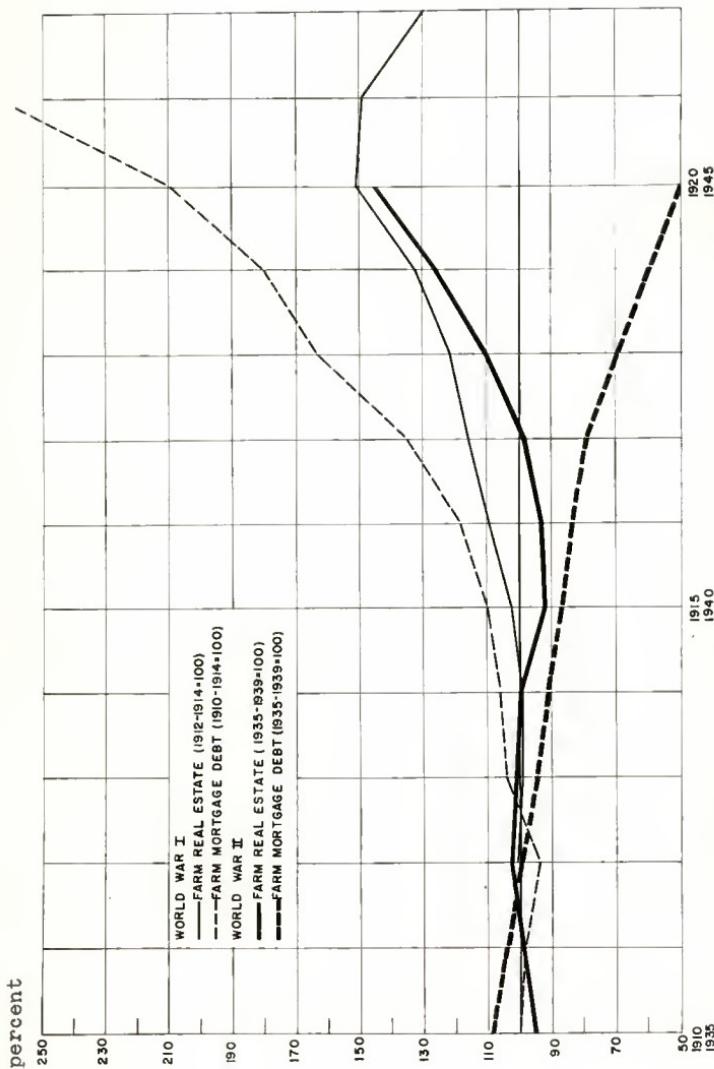


Fig. 9. Indexes of estimated value per acre of farm real estate on March 1 and farm mortgage debt on January 1 for Kansas.  
Source: Adapted from (8), (10), (13), (15), and (18).

all land would appreciate in value. There seemed no limit to the height that land prices might rise. With this outlook backed by soaring farm incomes, the per acre value of farm real estate in Kansas had advanced by the postwar year ending March 1, 1920, to a point 51 percent higher than the 1912-1914 average. On each March 1 after 1914 the index of real estate values were up six or seven points, for the rate of increase was quite gradual until the record 19 point rise in 1920 put the average value of all farm real estate in Kansas at about \$60 per acre. In the summer of 1920 prices of farm products broke and soon were followed in the downward course by deflated farm land values which at the low point in 1933 were 30 percent below the prewar average of World War I.

To many Kansas farmers, heavily in debt, the outlook in the prewar period of 1935-1939 was quite hopeless. Prices of farm products had not recovered a great deal from the severe depression of the early 30's; crop yields were low, especially in the drought year of 1936; incomes were not much higher than in the depression; credit was tight; and abandoned farms were still common sights in the western part of the state. Land values in 1935-1939 had recovered only slightly from the low point of 1933 and were 24 percent or nearly one-fourth less than the average per acre value of farm real estate in Kansas in 1912-1914. Land was no longer regarded as a "gilt-edged" investment. There was little of the makings of a land boom in the prewar period of World War II.

In the early years of World War II, 1940 and 1941, average farm real estate values in Kansas were lower than for any year in the prewar period, and although up slightly in 1942, were still below the 1935-1939 average. Part of the explanation of the slow rise in land values at the beginning of the last war was the fact that drops in farm income are not reflected in lower values for land until a year or two after the income is down. In 1938 cash farm income was quite low and not greatly improved in 1939. But, also to be mentioned as affecting the slow rise in land values was the fact that a large acreage of farm land in Kansas was held by creditors such as loan agencies. The supply of farms put on the market by these agencies was so great that land prices were held down for a time after the beginning of the war even though incomes were rising. After 1942, the year of the greatest relative increase in voluntary sales of farms, prices of land began to climb. The per acre value of farm real estate, as of March 1, advanced rapidly in the last three years, and in the year ended March 1, 1945, the index of farm real estate values in Kansas was 20 percent above that of the previous year. This put the average per acre value of farm real estate 46 percent above the 1935-1939 average, yet it was only 11 percent above that of 1912-1914. Relative to the prewar average, on March 1, 1945, farm real estate values in Kansas had gone up faster and to almost as high a level in World War II as during all the phases of World War I, but the average per acre value of farm land in-

cluding improvements at approximately \$44 per acre in 1945 was below the estimated \$60 of 1920.

Although Fig. 9 shows a close resemblance between the movement of real estate prices during the two wars, it strongly emphasizes the most significant economic difference of the two periods--the contrast between the upswing in total farm mortgage debt in World War I and the downswing in World War II. Total farm mortgage debt went up more rapidly than real estate values during the course of World War I. On January 1 of the postwar year of 1920, total farm mortgage debt was more than double the 1910-1914 average, while farm real estate values had increased only 51 percent. By January 1, 1921, total farm mortgage debt in Kansas at approximately 434 million dollars was 165 percent above the prewar average. Despite the fact that real estate values in Kansas rose nearly 50 percent during World War II, total farm mortgage debt on January 1, 1945, was 50 percent less than the average of the five years, 1935-1939. The level of farm mortgage debt in 1935-1939 was about twice as high as that of 1910-1914. At \$164,084,000 on January 1, 1945, total farm mortgage debt in Kansas approximated the average of 1910-1914 and was at the lowest point since 1912.

The reduction in farm debt that has taken place in the last five years can be explained in part by the higher farm incomes accompanied by the wartime lack of articles to buy. This dammed up purchasing power found some outlet in paying debts or in financing the purchase of land for cash. It has been variously

estimated that more than one-half of the land purchased in recent years has been paid for in cash. Too, Government urging and individual desire to be free of debt burdens should not be overlooked in explaining the lowering debt level. Many farmers caught in the debt mesh of World War I welcomed an opportunity to get out and stay out of debt. The farm real estate boom, if it can be called that, during World War II has been tempered with more caution than was displayed during the land boom of World War I which was followed by such disastrous consequences. From all indications the problem of agricultural adjustment in the postwar period of World War II will not be complicated by as heavy fixed charges as faced many Kansas farmers following the land spree of World War I.

## STUDIES OF THE EFFECT OF WORLD WAR II UPON INDIVIDUAL FARMS

The case studies of seven individual farms that follow in this section are illustrative of the results from the adjustments Kansas farmers made to the changing conditions brought by World War II. The operators of the farms used for this part of the study were members of the various Farm Management Associations in Kansas and had maintained their memberships continuously and kept account records of their farm businesses for more than ten years. Three of the farms were located in North Central and four in South Central Kansas. Located by type-of-farming areas, two farms were in Area 5, two in Area 6b, and one each in Areas 6a, 8, and 9.

All of the trends outlined in the wartime picture of the State's agriculture could be traced in some degree on the records of the farms studied. This was to be expected on a fairly representative group of farms for an appraisal of Kansas agriculture at a given moment is but the sum total of the changes taking place upon each of the approximately 150,000 farms within the state. Evidence of the trend for expanded production of crops and live-stock on the seven farms was indicated on Tables 1-8 by the pronounced upward tendency of receipts from these sources and reflected in the higher wartime incomes on all farms. Although no summaries of acreage and yield of crops were included for the farms, these figures were available for study and gave support to the above statement in regard to expansion of crop production. The acreage was increased from the prewar average on all but one farm and yields were higher on all farms in most of the war years. That rising prices were responsible for part of the increase in

livestock receipts on these farms was apparent, but increased numbers of livestock recorded on the inventories gave evidence of the higher volume of livestock and livestock products being prepared for market. The part played by favorable feeding ratios in helping to swell livestock receipts could be noted on all of the farms, but particularly on several of the farms where the operators bought more feed in certain years, and in most cases were well rewarded for such ventures.

As income went up on the seven farms, expenses of operation tended to rise, especially wages to hired labor, machinery costs, and the above mentioned costs for feed. Although the number of men employed did not decline greatly, there was considerable increase in the output per man. The higher costs for operation of machinery indicated greater dependence upon mechanization.

Particularly significant from the long-term view, were the improvements in net worth achieved by the operators of all seven farms during the war years. The higher level of farm income permitting sizeable reduction in debts was responsible for the increases in net worth which by January 1, 1944 for the seven farms ranged from 58 to 216 percent higher than the average net worth of 1935-1939. Since good accounting principles do not permit any appreciation in real estate values in order to keep up with rising prices, these values on the seven farms did not change unless additional land was purchased, and in case of purchase, the new real estate was entered on the record at cost. Price rises had some part in bringing increases in the valuation of working capital items such as grain and livestock, but the net worth increases

on the seven farms outdistanced increases in the general level of farm prices.

In selecting the farms for the case studies, an effort was made to choose farms of different sizes and types and with as wide a variation in combinations of enterprises as possible. Farms were classified by type according to the major sources of net receipts. A farm typed as cash grain derived 40 percent or more of its net income from wheat or other small grains. If 40 percent or more of the receipts came from cattle, hogs, and sheep, the farm was classed as animal specialty; while to be designated as a dairy farm required that 40 percent or more of the net receipts be derived from dairying. Farms with a wide variety of enterprises none of which individually furnished 40 percent of the net income were called general farms.

In 1940 two of the farms were operated by owners, four by part-owners, and one by a renter. By January 1, 1944, the tenure of the group had shifted to four owners, two part-owners, and one renter. The two operators who became owners had taken advantage of favorable wartime incomes to purchase the land which they previously had been renting. The farms ranged in size from 240 to 2030 acres, and the value of the real estate owned on January 1, 1944, varied from \$11,405 to \$56,795.

Although the farms of this group are somewhat larger than the average Kansas farm, represent a greater investment, and operate under better management, it is believed the changes represented here are illustrative of many of those which have characterized wartime agriculture in Kansas.

### An Animal Specialty Farm Emphasizing Hogs and Corn

This farm on the southern and western fringes of the Corn Belt had many of the characteristics of the typical Corn Belt farm. In the last ten years more than three-fourths of the total net receipts were from livestock enterprises. Hogs were the major project, but poultry was a close rival as a source of net farm income. In his crop organization the operator used wheat as his cash crop. During the greater part of the prewar period this farm averaged 160 acres with 95 acres in crops but was increased in 1939 by the purchase of a second quarter section.

Compared to the prewar average as shown in Table 1, the net returns from livestock averaged 95 percent greater during the five war years. Part of this increase was due to higher prices, but the average increase in hog numbers in the war years was 40 percent. In 1942 the operator took advantage of the favorable hog-corn ratio by purchasing more feed than usual as well as feeding more of the feed grown on the farm. The peak net income figure in 1943 suggests the success of the venture. However, by 1943 and 1944 feeding ratios were less favorable, yet hog numbers on this farm were at their highest level; other costs of operation were rising so that in 1944 the net income dropped.

The net worth on January 1, 1944, was 91 percent higher than the prewar average. Although the purchase of additional land at the beginning of the war nearly doubled his farm mortgage debt, this operator used his improved income to strengthen his financial position by reducing his indebtedness. If he can pay off his debts, he will be in a better position to meet postwar conditions.

Table 1. Changes from the prewar averages in income and net worth on an animal specialty farm emphasizing hogs and corn, World War II, 1940-1944, Kansas.

	1935-	1939	1940	1941	1942	1943	1944
<u>Net farm income</u>							
<u>Receipts</u>							
Livestock and livestock products	\$2,898	\$2,908	\$4,866	\$6,849	\$6,761	\$7,102	
Crops	578	511	1,008	339	1,059	1,611	
Miscellaneous	228	72	148	158	140	302	
Inventory changes in crops, feeds, and supplies	27	376	-	903	997	-	
Gross income	3,731	3,867	5,822	8,299	8,957	9,015	
<u>Expenses</u>							
Labor hired	22	12	416	578	709	678	
Feed purchased	1,100	710	1,038	2,125	1,823	2,508	
Machinery expense	391	499	513	703	861	589	
Depreciation	208	179	134	178	159	469	
Other expenses	761	854	900	887	782	919	
Inventory changes in crops, feeds, and supplies	-	-	887	-	-	992	
Total expense	2,482	2,254	3,688	4,471	4,314	6,155	
Net farm income	1,249	1,813	2,134	3,828	4,643	2,860	
<u>Assets, indebtedness, and net worth<sup>2</sup></u>							
<u>Working capital</u>							
Grains, feeds & supplies	778	1,186	1,602	976	1,383	2,900	
Livestock	2,444	3,048	3,126	4,087	4,313	4,545	
Machinery	1,020	915	812	779	826	1,583	
Cash & accounts receivable	398	777	750	750	850	650	
Total working capital	4,640	5,925	6,290	8,592	7,672	9,678	
Accounts & notes payable	528	890	960	-	-	-	
Net working capital	4,112	5,036	5,330	8,592	7,672	9,678	
<u>Fixed capital</u>							
Land & buildings	17,607	25,487	25,385	25,343	25,355	25,269	
Mortgage debt	5,200	9,689	9,217	7,748	4,880	3,485	
Net fixed capital	12,407	15,798	16,168	17,595	20,455	21,784	
Net worth	18,519	20,834	21,498	24,187	28,127	31,462	

1 Source: Farm Management Records 1935-1944.

2 As of January 1.

### A Dairy Farm Selling Wholesale Milk

Proof that stability of organization pays dividends was found in the 10-year record of this well-equipped dairy farm. Table 2 indicates that the net farm income for 1940-1945 averaged three times the prewar average income. Selling milk wholesale instead of retail required less labor and meant relatively more profit from the dairy herd. Higher prices for milk and an increase in the number of cows milked as compared to the prewar average brought a 50 percent rise in dairy receipts during the war years. But receipts from other livestock also swelled the income on this farm. A profitable poultry enterprise and until 1942 a sheep project were important supplementary enterprises. From time to time when feeding ratios were favorable, the operator fed some hogs and this project tended to replace the sheep enterprise after 1942.

The operator of this farm owned 200 acres and the cropping system on the owned land was organized to fit a dairy enterprise requiring ample supplies of feed and forage. Since 1936 an additional 160 acres was rented and more than half of this land was used for raising wheat. In the last few years wheat as well as other crop yields were good.

All through the five prewar years this operator carried a mortgage debt of more than \$12,000 on his 200 acres. The net worth section of Table 2 shows that by January 1, 1944, the farm was clear of debt. Because heavy fixed charges made it difficult to scale down the debt, the net worth on this farm went up rather slowly until the high income of 1943 made it possible to pay off both the long and short term debts.

Table 2. Changes from the prewar averages in income and net worth on a dairy farm selling wholesale milk during World War II, 1940-1944, Kansas<sup>1</sup>.

	: 1935- :						
	: 1939 :	1940	1941	1942	1943	1944	
<u>Net farm income</u>							
<u>Receipts</u>							
Livestock and livestock products	\$4,277	\$5,065	\$7,145	\$6,248	\$7,932	\$7,014	
Crops	1,017	356	2,040	3,006	5,896	6,658	
Miscellaneous	322	58	109	110	120	135	
Inventory changes in crops, feeds and supplies	-	2,015	-	225	-	-	
Gross income	5,616	7,494	9,294	9,589	13,948	13,807	
<u>Expenses</u>							
Labor hired	114	369	533	877	542	491	
Feed purchased	519	489	649	811	710	594	
Machinery expenses	811	1,096	913	1,261	1,149	1,110	
Depreciation	263	606	425	551	343	721	
Other expenses	1,690	1,690	2,072	2,014	1,535	1,993	
Inventory changes in crops, feeds, and supplies	282	-	165	-	147	970	
Total expense	3,679	4,230	4,747	5,314	4,445	5,879	
Net farm income	1,937	3,264	4,547	4,275	9,503	7,928	
<u>Assets, indebtedness, and net worth<sup>2</sup></u>							
<u>Working capital</u>							
Grains, feeds & supplies	1,554	984	3,034	2,914	3,157	3,009	
Livestock	3,103	3,546	4,173	4,086	3,974	4,124	
Machinery	2,426	3,252	2,978	3,151	3,195	2,961	
Cash & accounts receivable	103	203	223	627	300	28	
Total working capital	7,201	7,985	10,408	10,778	10,625	10,122	
Accounts & notes payable	2,420	3,198	4,540	2,825	2,321	210	
Net working capital	4,781	4,787	5,868	7,953	8,305	9,912	
<u>Fixed capital</u>							
Land & buildings	31,617	31,578	31,543	31,128	31,143	31,078	
Mortgage debt	12,678	11,652	11,040	10,405	8,251	-	
Net fixed capital	18,939	19,926	20,503	20,723	22,892	31,078	
Net worth	23,720	24,713	26,371	28,876	31,197	40,990	

<sup>1</sup> Source: Farm Management Records 1935-1944.

<sup>2</sup> As of January 1.

### A Typical General Farm

The general plan of organization providing for numerous sources of income was followed on this farm; and depending upon yields and prices, there was a tendency for the type to shift several times in the last ten years. However, in the last four years it was classed as a general farm emphasizing livestock. Receipts from cattle, hogs, poultry, dairy products, and cash grain made up the income and did not vary greatly in importance. This farm with 240 acres was the smallest in the group. The only expansion in size during the period considered occurred in 1936 when the operator began renting another 80 acres which later, in 1939, he purchased. As can be noted on Table 3, wages to hired labor were minor items of expense which indicated that the labor supply on this farm was the operator and his family.

While increases in income during the war years were not spectacular, the average of the income for 1940-1944 was more than twice the average income in the prewar period. Favorable feeding ratios for livestock in 1942 and good wheat yields in 1943 fostered the high income in the later year. An unusual characteristic of this farm, the absence of a mortgage debt, is pointed out in the net worth section of Table 3. The cash basis of this business also is indicated by the limited number and amount of accounts and notes payable. The increase in net worth on this farm was due primarily to increases in net working capital. More livestock, and larger inventories of grains, and more farming equipment caused the net worth on January 1, 1944, to be 58 percent above the average of the prewar years.

Table 3. Changes from the prewar averages in income and net worth on a typical general farm, World War II, 1940-1944, Kansas<sup>1</sup>.

	: 1935-	: 1939	: 1940	: 1941	: 1942	: 1943	: 1944
<u>Net farm income</u>							
<u>Receipts</u>							
Livestock and livestock products	\$1,637	\$1,174	\$1,349	\$2,552	\$3,180	\$2,590	
Crops	223	792	476	204	1,539	1,565	
Miscellaneous	73	13	141	146	128	25	
Inventory changes in crops, feeds, and supplies				490	20	-	
Gross income	1,853	1,879	1,966	3,472	4,867	4,180	
<u>Expenses</u>							
Labor hired	23	-	-	-	10	-	
Feed purchased	218	110	144	317	190	219	
Machinery expenses	129	180	179	183	231	312	
Depreciation	124	234	310	207	230	73	
Other expenses	208	196	206	318	314	201	
Inventory changes in crops, feeds, and supplies	81	126	10	-	-	415	
Total expenses	783	846	849	1,025	975	1,280	
Net farm income	1,060	1,133	1,117	2,447	3,892	2,900	
<u>Assets, indebtedness, and net worth<sup>2</sup></u>							
<u>Working capital</u>							
Grains, feeds & supplies	781	976	850	870	1,360	1,380	
Livestock	1,001	895	958	1,100	1,671	1,711	
Machinery	691	1,097	1,721	1,674	1,516	1,340	
Cash & accounts receivable	832	320	160	155	543	2,793	
Total working capital	3,305	3,286	3,589	3,799	5,090	7,224	
Accounts & notes payable	452	-	70	68	-	-	
Net working capital	2,853	3,286	3,519	3,731	5,090	7,224	
<u>Fixed capital</u>							
Land and buildings	8,908	11,240	11,246	11,270	11,428	11,405	
Mortgage debt	-	-	-	-	-	-	
Net fixed capital	8,908	11,240	11,246	11,270	11,428	11,405	
Net worth	11,761	14,526	14,865	15,001	16,518	18,629	

<sup>1</sup> Sources: Farm Management Records 1935-1944.

<sup>2</sup> As of January 1.

### An Animal Specialty Farm Utilizing Wheat as a Cash Crop

The operator of this farm maintained a small herd of pure-bred cows, and cattle raising was the chief enterprise. But, in three out of the ten years of record, hogs, the second ranking project, were credited with a slightly higher share of net returns than was furnished by the cattle. Although the acreage seeded to wheat was reduced somewhat below the prewar acreage during the war, wheat ranked third as an enterprise and was an important source of cash income. The only land purchased in the ten years was in 1936 when the operator bought 100 acres which raised the total of land owned to 197 acres. The balance of the 406 acres in this farm was rented land.

The ups and downs in net income during the war, as can be noted on Table 4, reflected the operators success or lack of success in adjusting his livestock operations to feeding ratios. Since he purchased a large part of the feed for his livestock, overexpansion of livestock numbers in the years feeding ratios were unfavorable tended to reduce the level of his net income in those years. But the average income for the war years was 68 percent higher than the prewar average income of \$2,790. By January 1, 1944, the net worth was 76 percent higher than the prewar average. Because the mortgage debt was being reduced slowly, the increase in working capital was much greater than the increase in fixed capital. The operator did not appreciate the value of his cow herd with rising prices for cattle but carried them at the normal or prewar value. So his financial position probably is stronger than is indicated in Table 4.

Table 4. Changes from the prewar averages in income and net worth on animal specialty farm utilizing wheat as a cash crop, World War II, 1940-1945, Kansas<sup>1</sup>.

	1935-	1939	1940	1941	1942	1943	1944
<u>Net farm income</u>							
<u>Receipts</u>							
Livestock and livestock products	\$4,709	\$4,834	\$8,449	\$10,206	\$9,575	\$11,860	
Crops	2,152	2,463	2,258	1,990	5,004	5,726	
Miscellaneous	691	615	296	1,226	1,613	467	
Inventory changes in crops, feeds, and supplies	-	1,046	-	1,073	1,163	-	
Gross income	7,552	6,956	11,006	14,497	17,576	18,043	
<u>Expenses</u>							
Labor hired	660	677	1,137	1,452	1,790	2,032	
Feed purchased	1,484	1,176	3,064	4,175	7,496	2,195	
Machinery expense	820	1,096	1,046	1,242	1,513	2,011	
Depreciation	610	403	631	548	338	787	
Other expenses	964	1,433	1,836	1,893	2,269	2,091	
Inventory changes in crops, feeds, and supplies	16	-	966	-	-	1,359	
Total expense	4,762	4,787	6,682	9,310	13,456	10,475	
Net farm income	2,790	4,171	2,323	5,187	4,118	7,566	
<u>Assets, indebtedness, and net worth<sup>2</sup></u>							
<u>Working capital</u>							
Grains, feeds & supplies	1,865	2,357	3,422	2,457	3,550	5,156	
Livestock	3,689	10,067	8,136	7,247	13,440	9,790	
Machinery	2,794	4,142	4,266	4,044	2,754	2,780	
Cash & accounts receivable	306	345	516	518	500	1,621	
Total working capital	6,654	16,911	16,340	14,266	20,245	19,347	
Accounts & notes payable	1,830	9,099	7,444	3,171	3,643	1,926	
Net working capital	7,024	7,822	8,896	11,095	16,402	17,421	
<u>Fixed capital</u>							
Land and buildings	13,707	14,907	15,202	14,511	15,086	16,476	
Mortgage debt	3,093	3,640	3,443	3,246	3,049	2,653	
Net fixed capital	10,614	11,267	11,759	11,265	12,037	13,623	
Net worth	17,538	19,089	20,665	22,360	26,439	31,044	

<sup>1</sup> Source: Farm Management Records 1935-1944.

<sup>2</sup> As of January 1.

### A Rented Wheat Farm

Judged by size and organization this tenant operated farm seemed more typical of wheat farms in western Kansas than was indicated by its geographic location. Wheat was the dominant enterprise, and during the war years the average acreage seeded to wheat was increased 11 percent above the 735 acre average of 1935-1939. In 1940 the wheat crop (as is suggested in Table 5 by the relatively low income for that year) was a total loss. This undoubtedly was a factor in causing the operator to increase the size of his beef cow herd and to make marked increases in the acreage seeded to feed crops. Abundant wheat pasture and a large acreage of permanent pasture were conducive to such a step. However, the results of these operations from the standpoint of income were considerably overshadowed by higher returns from wheat. Easily overlooked is the fact that livestock returns for the five war years averaged more than twice the average return from this source in 1935-1939. Averaging more than 2,000 acres since 1937, this farm was the largest in the group studied, and also the only one in which the operator had no real estate equity. The high degree of mechanization on this farm is suggested in Table 5 by the relatively small sum paid for wages and the large inventory of farm machinery.

Excellent wheat yields in 1941 and 1942 brought the peak income for this farm in 1942, while the average income for the five war years averaged 161 percent more than the income average of the prewar years. Changes in net worth represented changes in working capital, and the working capital in the war period averaged 53 percent higher than the prewar level.

Table 5. Change from the prewar averages in income and net worth on a rented wheat farm, World War II, 1940-1945, Kansas<sup>1</sup>.

	: 1935-	:	:	:	:	:
	: 1939	: 1940	: 1941	: 1942	: 1943	: 1944
<u>Net farm income</u>						
<u>Receipts</u>						
Livestock and livestock products	\$2,141	\$3,130	\$4,149	\$4,456	\$6,823	\$3,098
Crops	4,963	4,577	6,359	11,654	18,801	16,495
Miscellaneous	321	334	45	53	75	190
Inventory changes in crops, feeds, and supplies	674	-	5,196	5,868	-	-
Gross income	8,099	8,041	15,749	22,231	25,499	21,783
<u>Expenses</u>						
Labor hired	409	213	963	847	434	455
Feed purchased	174	559	226	666	496	1,016
Machinery expenses	1,385	1,876	2,285	2,973	2,806	2,694
Depreciation	1,215	626	493	1,105	908	1,319
Other expenses	1,072	1,666	596	4,699	1,889	1,622
Inventory changes in crops, feeds, and supplies	-	1,625	-	-	10,366	3,905
Total expenses	4,755	6,789	4,570	10,290	16,747	11,211
Net farm income	3,344	1,252	11,179	11,941	6,752	10,572
<u>Assets, indebtedness, and net worth<sup>2</sup></u>						
<u>Working capital</u>						
Grains, feeds & supplies	4,965	7,512	5,686	11,095	16,961	6,595
Livestock	2,401	3,100	6,009	5,629	7,800	7,095
Machinery	5,586	6,824	5,616	6,462	7,638	6,451
Cash & accounts receivable	1,096	4,077	371	3,120	6,916	2,478
Total working capital	14,050	21,313	18,484	26,508	39,315	22,619
Accounts & notes payable	530	2,515	3,100	6,776	14,570	-
Net working capital	13,520	18,798	15,384	21,730	24,745	22,619
<u>Fixed capital</u>						
Land and buildings	-	-	-	-	-	-
Mortgage debt	-	-	-	-	-	-
Net fixed capital	-	-	-	-	-	-
Net worth	13,520	16,798	15,364	21,730	24,745	22,619

<sup>1</sup> Sources: Farm Management Records 1935-1944.

<sup>2</sup> As of January 1.

### An Animal Specialty Farm Combining Cattle and Sheep

The operator of this farm used wheat as a backlog for extensive operations in handling livestock alternating his emphasis between cattle and sheep with hogs as a minor but less fluctuating enterprise. Most of the hogs, some of the sheep, but few of the cattle sold from this farm were raised on the farm. In the cropping system, wheat was the important crop, yet approximately 140 acres of alfalfa and usually about 100 acres of roughage were included as large quantities of such feeds were required in the years that cattle were wintered. However, in the last three years, the acreage of wheat was cut somewhat, while that in feed grains was increased considerably. The size of the farm was increased both by renting and purchasing additional land in the last ten years. During the war it averaged more than 700 acres with an average of more than 600 acres in crops.

Evidence that the operator had a thorough understanding of livestock marketing as well as livestock-feed relationships can be gained from the income section of Table 6. Since much of his livestock and the feed to fatten them was purchased, the operator was able to adjust his operations to take advantage of favorable livestock-feed ratios. The average level of his net income at \$4,618 in the prewar period was comparatively high and during the five war years the average was 145 percent above this figure. Increases in net worth due to increases in both working and fixed capital followed the higher net incomes during the war. Being able to borrow capital when he needed it most, contributed to the success of this operator's livestock feeding projects.

Table 6. Changes from the prewar averages in income and net worth on an animal specialty farm combining cattle and sheep with wheat, World War II, 1940-1944, Kansas<sup>1</sup>.

	1935-	1939	1940	1941	1942	1943	1944
<u>Net farm income</u>							
<u>Receipts</u>							
Livestock and livestock products	\$7,694	\$6,907	\$10,808	\$11,746	\$18,644	\$16,084	
Crops	2,466	5,864	9,154	3,041	10,649	15,543	
Miscellaneous	855	421	225	736	375	1,228	
Inventory changes in crops, feeds, and supplies	1,241	962	-	2,882	-	-	
Gross income	12,256	15,854	20,187	18,405	29,668	32,855	
<u>Expenses</u>							
Labor hired	832	1,247	1,495	1,356	1,609	1,682	
Feed purchased	2,896	2,052	4,430	3,906	5,643	4,648	
Machinery expense	1,113	1,249	1,547	2,283	2,082	3,951	
Depreciation	1,485	1,532	1,486	1,401	1,627	2,072	
Other expenses	1,311	1,561	1,488	1,653	2,073	1,788	
Inventory changes in crops, feeds, and supplies	-	-	1,634	-	993	40	
Total expenses	7,638	7,641	12,050	10,599	15,927	14,161	
Net farm income	4,618	6,213	8,137	7,806	15,741	18,694	
<u>Assets, indebtedness, and net worth<sup>2</sup></u>							
<u>Working capital</u>							
Grains, feeds & supplies	3,538	9,122	10,129	8,510	11,427	10,514	
Livestock	6,336	8,444	12,663	11,475	16,774	9,295	
Machinery	5,252	6,762	6,203	7,079	6,288	5,968	
Cash & accounts receivable	805	600	500	775	1,675	3,694	
Total working capital	15,931	24,928	29,515	27,359	38,164	29,471	
Accounts & notes payable	5,507	9,615	16,162	9,307	17,637	2,000	
Net working capital	10,424	15,313	13,353	18,532	20,527	27,471	
<u>Fixed capital</u>							
Land & buildings	40,109	42,294	55,295	55,243	57,399	56,795	
Mortgage debt	1,300	-	5,000	5,000	-	-	
Net fixed capital	38,809	42,294	50,295	50,243	57,399	56,795	
Net worth	49,233	57,607	63,648	68,775	77,926	84,266	

<sup>1</sup> Source: Farm Management Records 1935-1944.

<sup>2</sup> As of January 1.

### A Cash Grain Farm With Good Livestock Enterprises

The records of this farm furnish an outstanding example of results obtained by following approved farming practices directed by a skilled operator. Wheat was the major enterprise and the cash crop, but wheat on this farm meant something more than wheat for grain. The operator by his success with the use of certified seed, particularly the newly adopted varieties, built up a reputation for the production of certified seed which commands a premium above market price for wheat. Before the war, the operator had used sweet clover to restore soil fertility which paid dividends in better yields during the war. Beef production using a deferred feeding plan was the important supplementary enterprise plus small but profitable poultry and dairy projects. All the livestock enterprises were expanded during the war. By purchasing a rented quarter in 1943 he became owner-operator of a section. The acreage in crops varied since 1939 from a low of 431 acres in 1943 to a high of 500 acres in 1944.

Proof that the managerial efforts of this operator were well rewarded even in the prewar period can be seen in Table 7, which shows an average net income for 1935-1939 of \$5,034. Net income during the war ranged from a low of \$4,936 in 1941 to a high of \$19,886 in 1944 with the average for 1940-1944 at \$10,820. By January 1, 1944, the net worth on this farm was nearly three times greater than the prewar average. Increases in working capital were greater than increases in fixed capital. The mortgage debt was raised to \$19,500 by the land purchased in 1943, and although not shown on Table 7, the farm was cleared of debt in 1944.

Table 7. Changes from the prewar averages in income and net worth on a cash-grain farm with good livestock enterprises, World War II, 1940-1945, Kansas<sup>1</sup>.

	: 1935-	: 1939	: 1940	: 1941	: 1942	: 1943	: 1944
Net farm income							
<u>Receipts</u>							
Livestock and livestock products	\$5,848	\$6,245	\$6,919	\$6,036	\$10,812	\$6,571	
Crops	8,024	4,727	10,819	6,066	12,355	28,066	
Miscellaneous	363	358	539	1,799	3,931	1,564	
Inventory changes in crops, feeds and supplies	425	4,717	-	2,912	439	-	
Gross income	10,660	15,047	17,277	19,813	27,537	36,201	
<u>Expenses</u>							
Labor hired	609	1,020	1,522	2,105	2,088	2,610	
Feed purchased	1,164	2,493	3,124	2,983	2,689	1,131	
Machinery expenses	893	1,291	1,330	1,421	1,404	1,776	
Depreciation	587	865	864	1,161	1,410	1,247	
Other expenses	2,368	2,288	2,777	3,758	6,144	3,378	
Inventory changes in crops, feeds, and supplies	-	-	2,722	-	-	8,173	
Total expense	5,626	7,957	12,339	11,428	13,735	16,315	
Net farm income	5,034	7,090	4,938	8,385	13,802	19,886	
Assets, indebtedness, and net worth <sup>2</sup>							
Working capital							
Grains, feeds & supplies	2,251	5,633	10,356	7,634	10,546	11,025	
Livestock	2,464	6,739	9,400	12,075	11,080	10,465	
Machinery	3,194	3,713	3,912	5,156	4,415	4,350	
Cash & accounts receivable	563	302	268	151	45	325	
Total working capital	8,462	16,467	23,936	25,016	26,086	26,165	
Accounts & notes payable	1,768	5,148	6,782	9,221	9,863	8,395	
Net working capital	6,704	11,319	17,154	15,795	16,223	17,770	
Fixed capital							
Land & buildings	29,028	33,385	33,386	33,480	47,235	48,990	
Mortgage debt	18,480	18,000	18,000	13,500	19,500	12,000	
Net fixed capital	10,548	15,385	15,385	19,980	27,735	36,990	
Net worth	17,252	26,704	32,539	35,775	43,958	54,760	

<sup>1</sup> Source: Farm Management Records 1935-1944.

<sup>2</sup> As of January 1.

The seven examples described in the preceding pages indicate the manner in which the more capable farmers met wartime conditions and prepared their businesses for the uncertain conditions of the postwar period. It cannot be emphasized too strongly that the farms considered for this study were superior to the average Kansas farm. At the beginning of the war, these seven operators were running well established businesses which had not failed to earn a profit even during the adverse conditions of the prewar period. They were in a position to take advantage of favorable wartime prices and the favorable weather conditions to strengthen their financial positions and build up reserves for the future. No newcomer to the farming business could have made the gains recorded in the instances cited. There have been many Kansas farmers who failed to profit from the opportunities offered by farming in the war period, and some farmers in Kansas probably are in no better financial position than they were before the war.

The high capital investments noted on the examples point out the capital requirements for successful farm operations. If the real estate was priced at current values, the investment represented would be still higher. All of which should be discouraging to any person on the verge of buying land and equipment to start farming. For such an undertaking, the debts that it might be necessary to assume would soon prove burdensome if farm prices declined and weather conditions became less favorable. Farming in Kansas at the present time offers little opportunity to the returning veteran or other newcomer to the industry.

## SUMMARY AND CONCLUSIONS

1. The purpose of this study was to show the impact of the two wars upon price, production, and other related trends in Kansas agriculture; and by means of the similarities and differences between the two war periods to anticipate some of the postwar conditions of World War II.

2. The underlying method followed in the development of this study was analogy. Comparisons of the sequence of change in the two war periods was carried out chiefly by statistical analysis, but the case method was used for part of the study.

3. The prewar periods of the two wars were characterized by three important differences. World War I followed a relatively prosperous period for agriculture; World War II was preceded by the depression of the 1930's. Grain and food shortages existed in 1914; surplus commodities were problems in 1939. In 1914 the United States was a debtor nation, but after World War I she became a creditor nation.

4. Increased mechanization and improved varieties of crops were among the technological and other changes that occurred between the two wars.

5. Government regulation and control over prices while not unknown during World War I had a larger and more effective role in World War II.

6. Wheat production, absolutely and relatively, was much higher during World War II than during World War I, but the

opposite was true of wheat prices. The most all inclusive explanation of the price and production contrast is the difference in weather conditions of the two periods.

7. Relatively, feed-grain production increased more during World War II than during World War I. However, the level of feed-grain production was much higher in the World War I period, because of less mechanization and greater use of horse-power. Prices of feed-grains were higher and rose faster in World War I.

8. The production of flaxseed was not stimulated greatly by the rising prices during World War I; while during World War II, phenomenal increases in oil crop production were accomplished without like increases in price.

9. Because feeding ratios were more favorable during World War II, the volume of marketings of meat animals was much higher than during World War I. Relatively, price rises for meat animals were quite similar during both wars, with average prices for meat animals higher during the second World War, but prices of better grades going much higher during the first war.

10. Relatively, there was little difference in the average volume of marketings of dairy products for the two war periods, but the actual physical production of dairy products was almost twice as great during World War II as during the World War I period. Actually as well as relatively, prices for dairy products were not as high during World War II as during

the World War I period.

11. The production of poultry and eggs received little stimulus from the high prices during World War I, because feeding ratios were so unfavorable for poultry in that period. More favorable feeding ratios and point rationing of other meats led to considerable expansion in the volume of marketings of poultry and eggs during World War II, while the price trends for these commodities have followed rather closely those of World War I.

12. Cash farm income in Kansas made spectacular and strikingly similar gains during both wars, but it rose much faster and to a greater height during World War II. Increases in volume of production were more responsible than price increases for the rise in cash farm income accompanying World War II; while higher prices had the major role in pushing up the cash farm income during World War I.

13. Farm wage rates went up faster and to a higher level during World War II than during World War I. Cited among the explanations for this difference was the greater degree of scarcity of farm laborers during World War II, the higher cash income, and the increased efficiency in the use of farm labor.

14. Relative to the prewar average, farm real estate values in Kansas rose faster and to almost as high a level in World War II as during all the phases of World War I. But absolutely, the average per acre value of farm real estate as yet has not reached the level attained during the World War I period.

15. The most significant economic difference of the two war periods is the contrast between the upswing in farm mortgage debt during World War I and the downswing accompanying World War II. From all indications, the problem of agricultural adjustment in the postwar period of World War II will not be complicated by as high fixed charges as followed the land boom of World War I.

16. Case studies of the seven individual farms operated during the prewar and war periods of World War II indicated a number of changes characterizing wartime conditions of Kansas agriculture. All the farms showed substantial increases from the prowar income and net worth. There was greater emphasis upon the production of livestock as is illustrated by the higher volume of marketings from this source during the war. Most of the examples reflected the trend for increased size of farm and reduced level of debt.

17. It appeared that many farmers who were well established strengthened their positions by the end of the war.

18. The increase in agricultural prices placed farmers in a position to pay off debts and by staying out of debt, it seems probable that the farms studied will be able to withstand less favorable conditions that might develop in the post-war period.

19. Prices received by farmers behaved in much the same manner during both wars in spite of wider application and greater effectiveness of price controls during World War II. It is

logical to expect for the postwar period of World War II the same similarity in price behavior that characterized the two war periods. Even though the government price support program is as broad and effective as it was during the recent war, some degree of price deflation probably will be present in this postwar period.

20. Stimulated by wartime demand and aided by favorable weather, agricultural production in Kansas climbed to high levels during World War II. Because of improvements in technology resulting from the war, the potentialities for still greater expansion of agricultural production will be found in the postwar period of World War II.

21. If conditions should permit a high level of agricultural production to be maintained in this postwar period, lower prices for farm products might not bring the sudden drop in the level of farm income which followed World War I, since the effect of volume of production would tend to offset the decrease in price. The financial position of Kansas farmers as indicated by the decline in farm debt was improved greatly during World War II, and this will help to alleviate some of the unfavorable effects of lower farm prices and perhaps a lower level of farm income upon the welfare of the farm population.

22. The outlook for agriculture in the postwar period will depend upon a high level of consumption of farm products which means capacity production and full employment in other industries.

23. The uncertainties in regard to postwar conditions, and the need to keep down the level of debt make it dangerous to the individual and to the industry for novices in great numbers to enter farming at this time.

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## APPENDIX

Data For Charts

Table 8. Indexes of price and production of all wheat for Kansas. World War I (1910-1914 = 100) World War II (1935-1939 = 100).

World War I ::			World War II		
Year :	Price	Production	Year :	Price	Production
1910	109	67	1935	107	53
1911	98	56	1936	117	99
1912	103	98	1937	126	130
1913	91	80	1938	77	126
1914	98	200	1939	74	92
1915	132	105	1940	86	102
1916	140	110	1941	99	143
1917	249	46	1942	122	171
1918	234	103	1943	151	119
1919	250	161	1944	169	158
1920	251	156			
1921	133	142			

Note: Data for Fig. 1.

Source: Calculated from (9) and (10).

Table 9. Indexes of price and production of feed grains for Kansas. World War I (1910-1914 = 100) World War II (1935-1939 = 100).

World War I ::			World War II		
Year :	Price	Production	Year :	Price	Production
1910	95	142	1935	118	114
1911	87	95	1936	120	55
1912	103	141	1937	123	97
1913	97	27	1938	66	131
1914	113	95	1939	73	103
1915	106	141	1940	82	164
1916	113	64	1941	83	187
1917	220	109	1942	104	231
1918	240	49	1943	151	214
1919	258	77	1944	161	273
1920	198	144			
1921	68	105			

Note: Data for Fig. 2.

Source: Calculated from (9), (10), (11), and (14).

Table 10. Indexes of price and production of flaxseed for Kansas. World War I (1910-1914 = 100) World War II (1935-1939 = 100).

World War I ::			World War II		
Year :	Price	Production	Year :	Price	Production
1910	106	133	1935	89	89
1911	132	105	1936	96	43
1912	108	88	1937	113	81
1913	75	69	1938	104	97
1914	80	105	1939	97	190
1915	87	44	1940	94	345
1916	117	33	1941	97	394
1917	173	102	1942	136	459
1918	210	59	1943	165	527
1919	229	24	1944	171	116
1920	208	45			
1921	93	33			

Note: Data for Fig. 3.

Source: Calculated from (9) and (10).

Table 11. Indexes of price and production of soybeans for Kansas. World War II (1935-1939 = 100).

World War II		
Year	:	Price : Production
1935		104 131
1936		132 43
1937		84 65
1938		88 127
1939		92 129
1940		84 629
1941		118 1,137
1942		152 5,129
1943		148 4,673
1944		168 6,683

Note: Data for Fig. 4.

Source: Calculated from (9), (10), and (14).

Table 12. Indexes of price and physical volume of marketing  
of meat animals for Kansas. World War I (1910-  
1914 = 100) World War II (1935-1939 = 100).

World War I			::	World War II		
Year :	Price :	Volume		Year :	Price :	Volume
1910	96	106		1935	100	108
1911	84	115		1936	99	102
1912	97	98		1937	111	93
1913	109	96		1938	95	85
1914	114	85		1939	95	111
1915	106	110		1940	95	107
1916	126	114		1941	124	113
1917	173	111		1942	160	143
1918	196	114		1943	172	179
1919	199	117		1944	166	146
1920	164	98				
1921	100	102				

Note: Data for Fig. 5.

Source: Calculated from (12), (14), and (16).

Table 13. Indexes of price and physical volume of marketing  
of dairy products for Kansas. World War I (1910-  
1914 = 100) World War II (1935-1939 = 100).

World War I			::	World War II		
Year :	Price :	Volume		Year :	Price :	Volume
1910	100	92		1935	96	106
1911	91	100		1936	109	99
1912	104	97		1937	113	93
1913	104	103		1938	94	101
1914	101	106		1939	88	100
1915	101	112		1940	100	101
1916	112	113		1941	116	115
1917	146	119		1942	135	124
1918	178	120		1943	168	126
1919	211	125		1944	171	126
1920	210	122				
1921	144	137				

Note: Data for Fig. 6.

Source: Calculated from (12), (14), and (16).

Table 14. Indexes of price and physical volume of marketing  
of poultry and eggs for Kansas. World War I  
(1910-1914 = 100) World War II (1935-1939 = 100).

World War I			::	World War II		
Year :	Price :	Volume		Year :	Price :	Volume
1910	104	94		1935	114	101
1911	88	101		1936	109	91
1912	100	93		1937	102	94
1913	99	101		1938	96	91
1914	108	111		1939	79	122
1915	104	123		1940	83	93
1916	121	131		1941	115	103
1917	167	103		1942	150	133
1918	199	117		1943	188	165
1919	225	108		1944	172	159
1920	235	100				
1921	164	94				

Note: Data for Fig. 7.

Source: Calculated from (12), (14), and (16).

Table 15. Indexes of cash farm income from marketings and wages paid to hired farm labor for Kansas.  
 World War I (1910-1914 = 100) World War II  
 (1935-1939 = 100).

	World War I		::	World War II		
Year :	Income <sup>1</sup>	Wages		Year :	Income	Wages
1910	98	100		1935	98	88
1911	89	99		1936	107	96
1912	94	100		1937	113	104
1913	100	99		1938	86	105
1914	120	103		1939	96	104
1915	127	106		1940	99	106
1916	158	112		1941	146	123
1917	171	135		1942	210	169
1918	234	165		1943	262	233
1919	243	192		1944	244	275
1920	235	227				
1921	154	149				

Note: Data for Fig. 8.

Source: Calculated from (10), (12), (14), (16), and (17).

<sup>1</sup> Method of estimating cash income for the period 1910-1921. Figures for cash income by states from all crops, dairy products, and wool for Kansas from 1909-1942 have been published by the B. A. E., U. S. D. A. in the farm income series of Income Parity for Agriculture. However, no figures have been published for the income from cattle, hogs, sheep, and poultry by states for the years before 1924. In order to obtain an index of cash

income for the World War I period, it was necessary to make an estimate of the return from livestock. January 1, inventory figures for 1910-1924 and for 1935-1939 for cattle, hogs, and sheep were reduced to grain consuming animal units. The following factors were used cattle .51, hogs .37, and sheep .04. Published income figures for 1935-1939 for the various kinds of livestock were then divided by the animal units for the same years and a five-year average taken of the yearly returns per unit for cattle, hogs, and sheep. The animal units for each year for 1910-1924 were multiplied by their respective returns and the sum for each year taken. This sum was then adjusted for each year by the U. S. D. A. index for Kansas of prices received for meat animals shifted to a 1935-1939 base. By adding the sum secured for livestock income to the known figures for crops, dairy products, and wool an estimate of total cash income for 1910-1924 was obtained which included all receipts except those from poultry. Inventory figures for poultry could not be obtained before 1924, but on the known figures from 1924-1934, poultry income averaged 10 percent of total cash income. So 10 percent was added to the estimated for 1910-1924 to allow for poultry returns. Comparing the estimated total cash income for 1924 with the published total for the same year, the percentage of error on the estimated figure was less than five percent. Further testing of the method by making estimates for 1935-1943, showed errors ranging from two to eight percent of the published total cash income for those years.

Table 16. Indexes of estimated value per acre of farm real estate and farm mortgage debt on January 1 for Kansas. World War I (1912-1914 = 100) for farm real estate and (1910-1914 = 100) for farm mortgage debt. World War II (1935-1939 = 100).

World War I			::	World War II		
Year :	Real Estate	: Debt		Year :	Real Estate	: Debt
1910	--	100	1935	96	109	
1911	--	98	1936	99	105	
1912	101	94	1937	103	100	
1913	99	104	1938	102	95	
1914	99	106	1939	100	92	
1915	103	110	1940	96	87	
1916	109	118	1941	94	84	
1917	115	135	1942	98	79	
1918	122	163	1943	111	70	
1919	132	179	1944	126	60	
1920	151	209	1945	146	50	
1921	149	265				
1922	130					

Note: Data for Fig. 9.

Source: Adapted from (8), (10), (13), (15), and (18).